

Chemical Week

December 25, 1954

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► **Chemical firms build goodwill, add their bit to the nation's Yuletide sparkle p. 19**

The trend in epoxidation is to simplified processes for lower cost, better profit p. 32

Insecticide makers are cozying to systemics; still new, they're waxing in importance p. 44

Is the salt cake shortage real or apparent? Here's today's-and tomorrow's-picture p. 55

Parts-per-billion is the range of impurities in silicon from GE's new process p. 62

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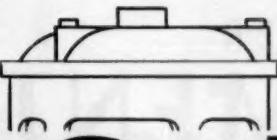
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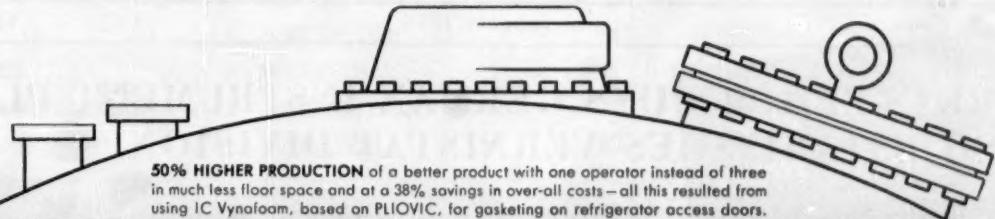
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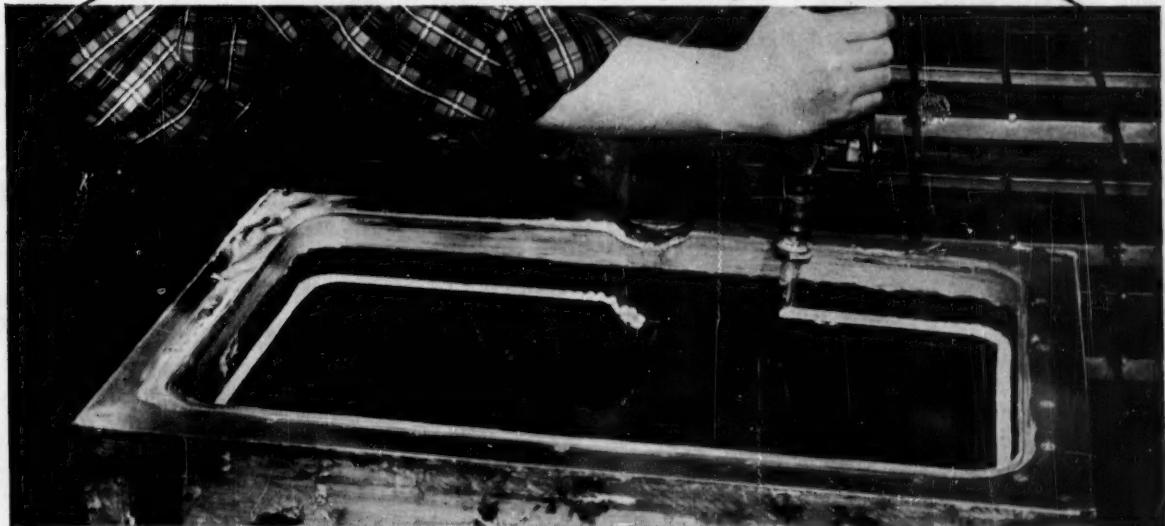




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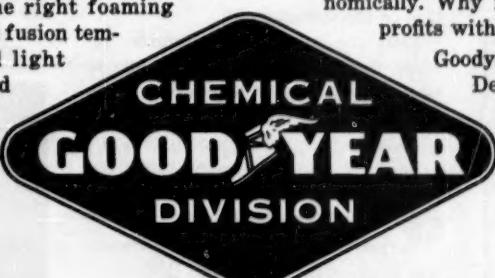
GASKETS that go anywhere faster, at lower cost and with fewer rejects, are now made with IC Vynafom—vinyl plastisols that flow, then foam in place. A few minutes' heat, at atmospheric pressure, uniformly expands the extrudable paste to 300%-400% of its original volume. The resultant, evenly textured foam gives a tough, tight, continuous seal of virtually any size or shape.

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THE PERKIN-ELMER INSTRUMENT DIGEST

A condensation of some articles in the Fall issue of THE PERKIN-ELMER INSTRUMENT NEWS, a publication of The Perkin-Elmer Corporation, manufacturers of scientific instruments—Infrared Spectrometers, Tisellus Electrophoresis Apparatus, Monochromators, Flame Photometers, Continuous Infra-

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Norwalk, Conn.

January, 1955

Vol. 6, No. 1

PERKIN-ELMER BUYS GERMAN INSTRUMENT PLANT; ALSO ESTABLISHES VERNISTAT DIVISION

During September, Perkin-Elmer made two important announcements. First, it has acquired an optical plant in West Germany. Second, a new division, the VERNISTAT Division, was established.

● **German Plant**—Perkin-Elmer's new German plant is Bodenseewerk of Ueberlingen, Germany, located on Lake Constance near the Swiss border. The plant covers 14,000 square feet and employs over 200 persons. Its principal products are cameras, theodolites, sound recorders, compasses, aircraft-testing instruments and testing apparatus for rocket and bomb-releases.

Until 1952, Bodenseewerk was operated as the southern branch of Askania-Berlin, the well-known German optical company. Much of the company's current output is for British, French and American governments. Eventually products of Perkin-Elmer design will be made there.

● **Vernistat Division**—The VERNISTAT, a new type of precision variable-ratio transformer, is Perkin-Elmer's latest product. Complete technical details of this voltage divider are available on request. Because of its unique properties: low output impedance combined with high resolution and linearity, VERNISTAT will find wide usage in analog computers, servos and control systems.

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Bodenseewerk: Perkin-Elmer's new German plant on the shores of Lake Constance.

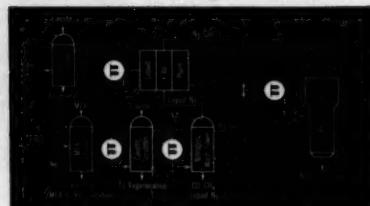
Analytical Control Means "On-the-line" Savings

Perkin-Elmer's role in instrumentation centers about the words "Analytical Control." Today's typical chemical processing plant seems to run itself. Hundreds of accurate, reliable instruments maintain constant checks on the quantity, pressure, and temperature of the great mass of materials that flow through the maze of pipes and towers in the plant.

Yet with these instruments alone, it would be next to impossible to operate the plant. Suppose the composition of a raw material stream changes—or a catalyst slips in efficiency. These are only two changes that can occur without conventional instruments noting any change—for they record only the stream environment—not the composition of the stream itself.

Only the Analytical Laboratory reveals the stream's true composition, hence "True Control Begins with Analysis." In most cases today the analytical lab is anywhere from minutes to hours behind the process stream itself, but with on-the-line process control (right), even this delay will disappear.

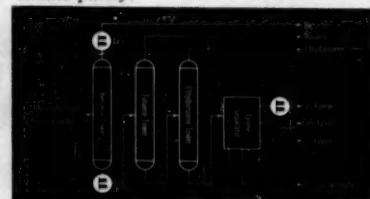
Perkin-Elmer's concern with Analytical Control is in both the laboratory and plant itself. Perkin-Elmer instruments cover both locations—and the all-important connecting pilot plant link.



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Chemical Week

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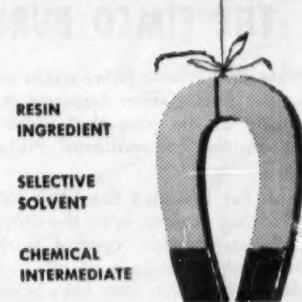
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OPINION . . .

Service to Science

TO THE EDITOR: I feel that you have done the cause of responsible science a real service in the article, "Social-Conscious Scientists" (Nov. 6, p. 18), describing the activities and aims of the Federation of American Scientists. It is a great pleasure to feel that our activities have been sufficiently worthwhile to be noted and commented on in your publication.

M. STANLEY LIVINGSTON

Chairman

Federation of American Scientists
Massachusetts Institute of Technology
Department of Physics
Cambridge, Mass.

Ten Years Young

TO THE EDITOR: I must take exception to your Nov. 27 statement (p. 86) that the industrial participation program at the University of Michigan is "one of the first of its kind" or even "new" at all.

The current nationwide program to provide industrial support for universities is now almost 10 years old. The University of Chicago, with its metallurgical institute, is generally considered to have originated the post-World War II program to get industry and academic research together. Probably the best known is MIT's industrial liaison program, which has over 70 participating corporations. These corporations, which give "unrestricted grants-in-aid" of from \$10,000 to over \$50,000 a year, are provided access to any phase of MIT's broad research program, including special symposia, publications, conferences in the laboratories. The ILP, started in 1947, now provides an important part of MIT's unrestricted operating funds.

These two plans were rapidly followed by Princeton, Case Institute, Cal. Tech., Cornell, and other universities.

The basic purpose is the same in all cases:

- (1) Industrial support for institutions hard-pressed by higher operating costs.
- (2) Realization that industry has a

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

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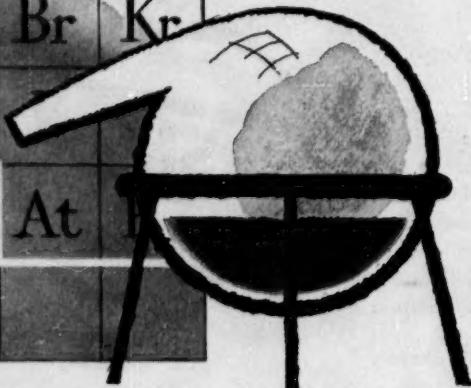
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OPINION . . .

stake in these institutions (the intangible motivation).

- (3) Providing faculty and students with contacts outside the ivory tower in order to give them perspective.

W. L. ALLISON
Product Commercialization Dept.
Olin Mathieson Chemical Corp.
New Haven, Conn.

'Day of Reckoning'

To THE EDITOR: Your news article on titanium dioxide (Dec. 11, p. 89) carries no by-line, but the author or authors certainly should be complimented on their presentation of a very timely topic.

With the steadily increasing demands and diversification of uses of white titanium oxide, plus the accelerated production of titanium metal sponge, the question of available raw materials will soon be a problem for serious study.

I believe it has been roughly calculated that from 2½ to 3 tons of titanium ore are required to produce 1 ton of white oxide, and from 3 to 3½ tons of ore to produce a ton of titanium metal sponge. Using these factors, a rough idea can be had as to what tonnages of ilmenite or other comparable titanium-bearing material will be required annually to meet production needs. The day of reckoning may not be as distant as some believe. Development of adequate ore reserves should anticipate by a number of years potential future requirements of titanium sponge and titanium pigments. An article on this phase of the titanium industry might prove of great interest both to your readers and to industry.

H. C. MEYER
Chairman of the Board
Foote Mineral Co.
Philadelphia, Pa.

DATES AHEAD . . .

Chemical Market Research Assn., joint meeting with CCDA, subject: chemicals in foods and feeds, Edgewater Beach hotel, Chicago, Jan. 20-21.

Plant Maintenance and Engineering Show, International Amphitheatre, Chicago, Jan. 24-27.

Chlorine Institute, annual meeting, Biltmore hotel, New York, Jan. 26.

Assn. of American Soap and Glycerine Producers, annual convention, Waldorf-Astoria hotel, New York, Jan. 26-28.

Chemical Institute of Canada, protective coatings division conference, Royal York hotel, Toronto, Feb. 24; Ritz Carlton hotel, Montreal, Feb. 25.

Creative engineering...in chemistry and equipment

How Firestone's "tire-less division" turned a difficult problem into a bonanza



You can take the products made from Firestone's Exxon resins and hammer them, drop them, dump acid on them, subject them to heat and light, and they come up smiling.

When you want it to, one of these vinyl resins sticks stubbornly to metals and other surfaces. At last count, you could buy them in a dozen different types and a wide range of colors. They are used for an amazing variety of end products—both decorative and functional.

The research boom

Firestone went into the plastics business as a natural outgrowth of synthetic rubber research. As the iron fist of World War II closed the valves on imported rubber, latex-thirsty factories turned hopefully to the research people. Alert management capitalized on this research boom, and Firestone's two-million-dollar research center on a hilltop in Akron has pro-

duced new developments in textiles, metals and plastics as well as rubber.

The excitement over Exxon and its sister Velon (durable sheeting used in upholstery, drapes, etc.) placed great demands on the plant at Pottstown, Pa. Operating on a continuous basis, Firestone had to have equipment that needed little rest and would require very little maintenance. And this is one place where the antistick qualities of Pfaudler equipment were most helpful.

Solving the problem

Working together, Firestone and Pfaudler engineers selected glassed steel processing equipment, because vinyl resins don't usually stick to the glassed surface. At the same time, they got the durability they wanted, too, because Pfaudler glassed steel equipment combines the corrosion resistance of glass with the structural strength of steel.

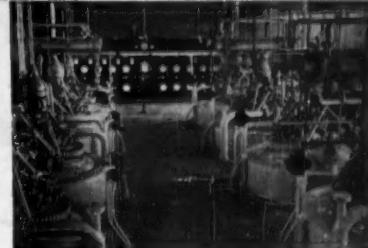
If you have a knotty problem in chemical processing, or if corrosion is nibbling at your profits, we may be able to show you the answer with Pfaudler glassed steel or alloys. Mail the request slip for full data, or write us and outline your problem.

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LOOKING IN—Roger S. Firestone, President of Firestone Plastics Co., and E. T. Handley, Plant Manager, check a Pfaudler polymerizer which is used for processing their vinyl resin, Exxon.



NO STICKING—The nonadhesive, corrosion-resistant surface of these glassed steel polymerizers keeps Firestone's Exxon plastics on stream with a minimum of downtime.

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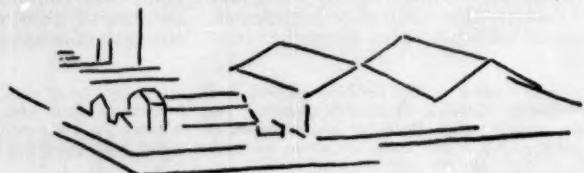
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NEWSLETTER

Manufacturing Chemists' Assn.'s President William Foster last week took a look at the current status of the chemical industry, sketched on that foundation a picture of what's ahead. Salient points of his business forecast:

- In the year ending last Oct. 31, the industry completed privately financed construction projects costing over \$1.2 billion. Under construction or definitely planned were another \$1.5 billion's worth of expansion projects.
- Also under way or planned is \$3.4 billion's worth of government-financed chemical construction.
- No difficulty in financing is foreseen.
- Sales this year are almost equal to last year's (\$15,185 million vs \$15,222 million for first nine months) and indications are that 1955 sales will clearly top 1953's \$19,865 million.
- Inventory position is good. It totaled \$1.46 billion at the end of September—\$13 million less than the preceding month but \$21 higher than the previous year.
- "Barring an inflationary situation, efficient production of goods by plant brought onstream in recent year should indicate lower unit costs."

Looking further ahead, Foster sees a tremendous expansion—by necessity—of chemical processing. It must step into the breach caused by inadequacy of current energy sources 50 years hence to maintain our living standards. Whatever source is tapped—nuclear energy, solar energy, fuel cells, shale oil, etc.—chemicals and chemical processes will play a major role.

Still much alive in the law courts is the Texas City ammonium nitrate explosion of April, 1947. Filed last week in federal district court at Houston was a list of over 4000 claims against the Republic of France and the Compagnie Generale Transatlantique. The list was filed by the French government, and the French Line as a part of its admiralty action seeking limitation of liability or exoneration.

Some of the claims are as low as \$2, but others are whoppers: U. S. government, \$400 million; Texas City Terminal Railway, \$12 million; Humble Pipe Line, \$739,235; and RFC, \$350,000 are examples.

Jefferson & Lake Sulphur got an early Christmas present in the form of a \$448,732 check from the state of Louisiana. It's the first half of a payment due the company under a mineral lease it had back in the early '20s. Prolonged litigation was fruitless until 1948, when the state supreme court ordered payment, but not until this year did the state legislature pass enabling legislation.

First major plunge by Weyerhaeuser Timber into chemical manufacture is a 96-cell chlorine-caustic plant at Longview, Wash. Capacity: 100 tons/day of chlorine, 115 of caustic. The plant, due onstream late in

NEWSLETTER

1955, will supply the firm's pulp mills at Longview and Everett, Wash. Salt will come from San Francisco.

Herbert W. Bertine is the next industry man to take over directorship of BDSA's Chemical and Rubber Division. Bertine, assistant counsel of Allied's General Chemicals Division, will replace Carl Morrison, who will return to Jersey Standard Oil. An oldtimer in Washington (with War Assets Administration, 1942-48), Bertine reports Jan. 3.

Adhering to its hoped-for schedule (CW Newsletter, Dec. 18) the Rubber Producing Facilities Disposal Commission signed sales contracts last week for six of the 27 plants slated for sale:

- Shell Chemical picked up three plants in the Los Angeles area—an integrated setup to produce styrene, butadiene, and 207,000 tons/year of copolymer. Original cost: \$51.2 million; book value: \$16 million.
- Goodrich-Gulf (B. F. Goodrich and Gulf Oil) and Texas-U. S. Chemical (Texas Co. and U. S. Rubber) will share a butadiene plant and each buy a copolymer plant at Port Neches, Tex. Aggregate original cost: \$94.3 million; book value: \$29 million.
- Phillips Chemical gets the butadiene and copolymer plants at Borger, Tex. Original cost: \$52.6 million; book value: \$16.3 million.

Tall oil processing is a departure for Hercules Powder. The firm has optioned an 80-acre site near Franklin, Va., on which it expects to complete a multimillion-dollar plant early in 1956.

Hercules will make resins, purified fatty acids and related products from crude tall oil obtained from nearby kraft pulp mills.

Reaction was quick and favorable to the signing last week of an agreement whereby natural gas will be piped from the Peace River area of Canada to Vancouver and the U. S. Pacific Northwest (see p. 15). Whether or not it promises petrochemical development in the Pacific Northwest, it means that domestic gas will be conserved.

Westcoast Transmission will start construction early next year, finish by the fall of 1956 a \$100-million pipeline through the interior of British Columbia from Fort St. John to Sumas, at the U. S. border. Provincial utilities will spend upwards of \$12 million for facilities to distribute the gas.

Proposals for U. S. use still require Federal Power Commission approval, but the deal calls for export to the U. S. of 300 million cu. ft./day.

Natural gas price boosts will be harder for independent producers to get under new regulations issued by the FPC.

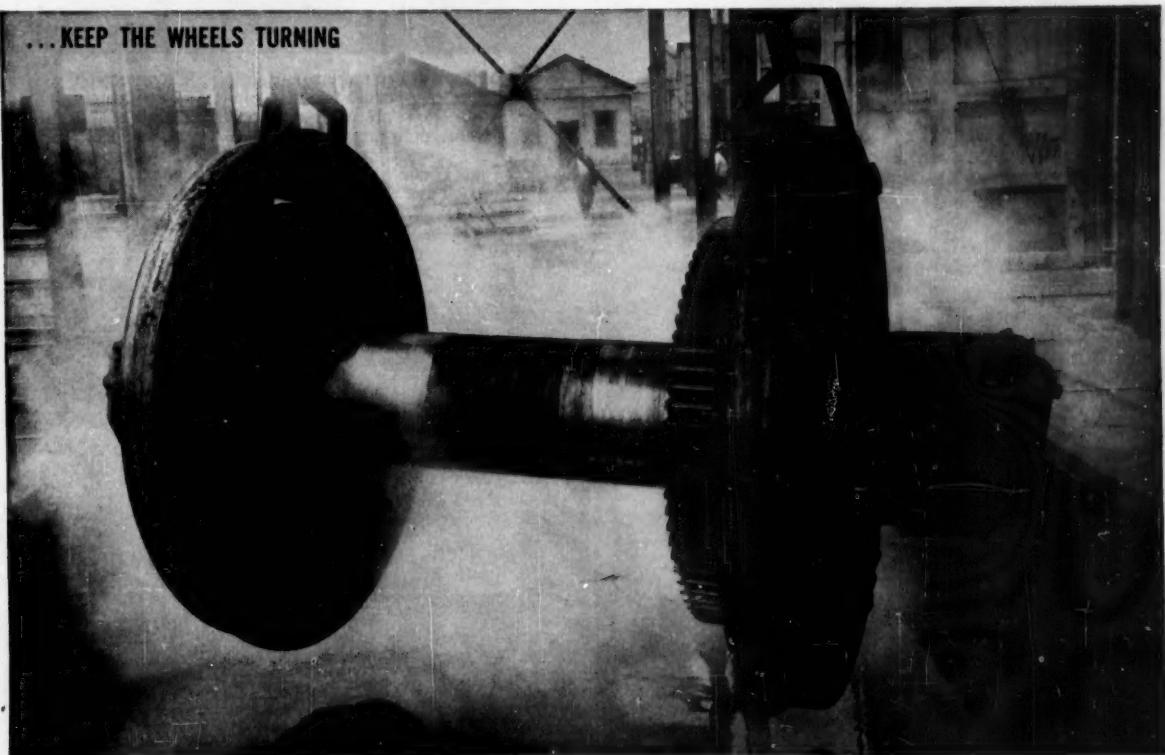
The new Order 174-B (supplanting 174-A) outlaws two types of price escalation clauses now common in many contracts between producers and pipelines:

Out goes the "spiral clause" that allows a producer an automatic increase if FPC grants the pipeline customer a higher rate. In the past, this had led the pipeline to ask for still another boost.

Also forbidden is the "favored-nation clause" that allows a rate boost if (a) one of his pipeline customers pays him more, or if (b) other producers in the same field get a higher rate.

... The Editors

...KEEP THE WHEELS TURNING



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► **VERSATILE RAW MATERIAL**—The linters left on cotton seed are made into chemical cotton (bleached cotton linters) by Hercules' Virginia Cellulose Department. In high-grade paper, chemical cotton replaces rags, eliminates costly rag sorting. And chemical cotton is the best source of cellulose, key to products ranging from lacquers to plastics.

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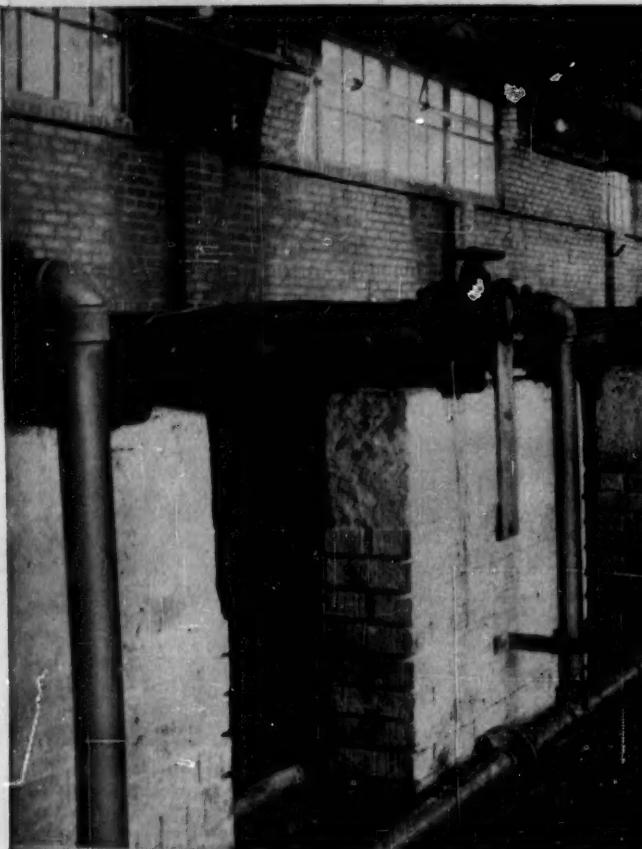


Photo shows inspector examining Uscolite pipe lines on vacuum boxes in plant. Lower illustration shows 2" discharge line from a plate and frame polishing press in same plant. Engineers are comparing the clean lines of Uscolite pipe and Uscolite Hills-McCanna valve with the corroded metal pipe at the left.



HERE'S PROOF CORROSION DOES NOT HARM U. S. USCOLITE PIPE

Read what this plant discovered about U. S. Uscolite®

A chemical processing company* in Michigan makes Mono Sodium Glutamate (MSG) in bulk. By-products are adhesives for cigarette papers, wallpaper sizing and allied items. To handle the highly corrosive raw and dilute hydrochloric acids, this plant began to use U. S. Uscolite Pipe 5 years ago. The results were so impressive that the company's policy is now to replace only with U. S. Uscolite Pipe. The milling company found that:

- (1)—Not one single length of U. S. Uscolite Pipe has yet failed from corrosion. The plant capacity is 12 million lbs. of MSG a year.
- (2)—Not one single length of Uscolite has failed from impact

shock or any other reason.

(3)—Although temperature ranges from 150° to minus 10° F., these extremities of temperature have had absolutely no effect on Uscolite Pipe.

(4)—Uscolite is easier to handle because it weighs less. It is cut to length and threaded on the job. Its great impact strength prevents breakage.

A development of United States Rubber Company, Uscolite pipe and fittings provide a corrosion-resistance and a stamina never before obtainable in piping. Place your order for Uscolite pipe and fitting with any of our 27 District Sales Offices or write address below.

*The Huron Milling Company.



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BUSINESS & INDUSTRY . . .

You still have two weeks to protest proposed IRS rulings in these and other areas:

- Stockholders' liability if corporation distributes stock and other assets to stockholders.
- Effect of last in-first out inventory accounting when corporation is sold.
- Tax liability of corporations that "spin off" a new corporation.
- Corporate reorganizations that may be tax-free.
- Liability of corporation and stockholder when a company goes out of business.

Aid to Understanding

Corporation officials who have been trying to puzzle out how the new tax law affects purchase of companies, mergers, and stock distribution plans, have received their first big assist from the Internal Revenue Service. A tentative regulation, revealing the first IRS attempts to interpret this section of the new law, was published in Washington last week—a full 37 pages of fine print.

The regulation is not final in its present form. Taxpayers can suggest changes if they write in before Jan. 11. After that, public hearings may be held, but it will be months before the regulation will be issued in final form.

In general, tax experts are reacting critically to the IRS proposal. They argue that Congress said it wanted to make corporate reorganizations and distributions simpler than under the old law. But the proposed rules governing such items as dividends in kind, liquidations, and spin-offs appear to be just as involved as ever.

The new law, for example, tried to clear up the question of whether a corporation or the individual stockholders had to pay a tax on the sale of assets in liquidation.

In some circumstances under the old law, both corporation and the stockholders wound up paying a tax on the same transaction. Now the new law says the corporation shall not be taxed on profits stemming from sale of prop-

erty after the adoption of a formal plan of liquidation.

But this offers questionable protection under the tentative IRS regulation. Instead of setting up a simple set of rules for determining what qualifies as a formal plan, it says tax officials, and eventually the courts, will have to decide in individual cases. Far from making the liquidation of corporations easier, some private tax experts believe this muddies the issue.

The regulation in its present form also fails to come up with a simple explanation of when spin-offs will be tax free. In a spin-off, a corporation sets aside some of its assets in the name of a new company, and distributes stock in the new enterprise to its shareholders. The new law says spin-offs shall be tax free if the new corporation is actively engaged in business.

Of General Help: Some general guidance is offered by the new regulations, however. A new corporation, for instance, must now carry on a specific operation for the purpose of earning income. But in detail, the water's still muddy. A research and development department, even when set aside as a corporation, does not constitute a trade or business, IRS says. But a manufacturing plant can be broken off into a separate corporation, and can qualify as a tax-free spin-off.

The examples in themselves are clear enough. But tax analysts are

wondering what they add up to by way of over-all guidance. They wonder if they're going to have to get individual clearance for spin-offs. If so, they can't see how the new law is going to make this type of reorganizations any easier.

Before such questions are cleared up, the proposed regulation is likely to get an exhaustive rewriting. Officials believe a public hearing will probably be held, though this depends on the kind of questions and suggestions that are received by mail over the next few weeks.

To Nip in the Bud

Whether to stick by its guns on the proposed new antidumping regulations (CW, Nov. 20, p. 30) or to make the new rules kinder to importers or to domestic producers is the decision being faced by the Treasury Dept. this week.

At a hearing last week in Washington, Asst. Secretary of the Treasury H. Chapman Rose heard conflicting arguments on the "fair value" definition that means so much to certain chemical companies. While U.S. chemical firms generally approve of Treasury's plan to make "fair value" the same as "foreign market value" in most cases, importers pleaded to have this clause watered down.

If the difference between market value in the foreign country where the product was made and the product's selling price in the U.S. is due only to market conditions in the U.S., the dumping charge should not apply, asserted William Barnhard, counsel for importers. He cited a recent case involving rayon staple fiber as one in which importers simply lowered their prices to U.S. levels, which were under prices on the world market.

Opposing that suggestion was Bernard Fitzgerald of the American Coke & Coal Chemical Institute. He urged that the Treasury Dept. make its antidumping rules even stronger by adopting the system used in Canada and the United Kingdom. In those countries, Fitzgerald explained, a customs appraiser can determine at the time of entry whether an import is being dumped, because the importer is required to list on the invoice all information needed for such a determination.

SBA'S CHEMICAL CLIENTS

(Chemical process companies that have received loans from the U.S. Small Business Administration up to Dec. 9, 1954)

Company and location	Product	Amount and type of loan
Ackerman Welding Supply Co., Aberdeen, S.D.	Oxygen, acetylene for welding	\$50,000—B.P.
Angelus Aircraft, Inc., Los Angeles, Calif.	Glass fiber-reinforced products	125,000—D.
Bioproducts Oregon, Ltd., Warrenton, Ore.	Fish oils and pharmaceuticals	40,000—D.
Carbotex Chemical Co., Inc., Tewksbury, Mass.	Synthetic resins	15,000—B.P.
Certified Solvents Co., Los Angeles, Calif.	Lacquer, thinners, aircraft dope	8,000—D.
Chase Chemical Co., Newark, N.J.	Pharmaceuticals	100,000—D.
Chemical Insecticide Corp., Brooklyn, N.Y.	Insecticides	90,000—D.
Daniel H. Jones Laboratories, Inc., Camden, N.J.	Fluosilicate specialties	15,000—D.
Farm Fertilizer Service, Columbia, Mo.	Fertilizer	10,000—B.P.
Hamilton-Bailey Engineering Co., Danville, Ind.	Masking devices for selective surface treatment	14,000—B.P.
Harry H. Rogers Co., Inc., Chicago, Ill.	Chemicals, solvents, oils for graphic arts industry	30,000—D.
John L. Armitage Co., Inc., Newark, N.J.	Synthetic enamels	60,000—B.P.
Klix Chemical Co., San Francisco, Calif.	Soaps, disinfectants, cleaners	150,000—D.
N'Land Industries, Inc., Lewiston, Ida.	Liquid fertilizer	14,750—D.
Northeast Mississippi Fertilizer Co., Amory, Miss.	Fertilizer	36,000—D.
Rowell Laboratories, Inc., Baudette, Minn.	Pharmaceuticals	65,000—B.P.
S. & E. Chemical Co., Chicago, Ill.	Industrial hand soaps and cleaners	13,500—D.
Scioto Farm Chemicals, Inc., Chillicothe, O.	Fertilizer	50,000—B.P.
Sure Seal Corp., Salt Lake City, Utah	Waxes	250,000—B.P.
Terpentine Farmers Corp., Waycross, Ga.	Terpentine and resin products	50,000—B.P.
Tri-state Chemical Co., Henderson, Ky.	Fertilizer	80,000—B.P.
Zac-Lac Paint & Lacquer Corp., Atlanta, Ga.	Paints	100,000—B.P.

Key: B.P., bank participation; D., direct loan.

funct Reconstruction Finance Corp., SBA is slated to go out of business next July 1. But with Republicans and Democrats seeking to outdo each other in beefing up SBA, it's a sure bet that the agency will get a new lease on life before that date.

Higher Loan Limit: Sen. John Sparkman and Rep. Wright Patman, the Democrats' principal small business champions, are critical of the Administration's program, say the Republicans are only paying lip-service to small businessmen. They want to:

- Boost the maximum loan limit from the present \$150,000 to at least \$500,000.
- Provide long-term financial assistance for small business.
- Legislate a substantial increase into SBA's revolving fund.
- Strengthen the agency's independence.

While SBA now is an independent agency, its program is still tied pretty much to policy set by Commerce Secretary Weeks and Treasury Secretary Humphrey. Weeks and Humphrey, along with SBA Administrator Barnes, make up SBA's loan policy board. The Democrats also want to make SBA a permanent agency, not subject to periodic renewal of authority by Congress.

Smaller, More Numerous: During its first year of operation as a government lending agency, SBA has received loan applications from nearly 90 chemical process companies, 22 of which have been granted loans (see table). It's readily apparent that these loans are smaller and more numerous than the chemical loans that were still on the books when RFC closed its doors (CW, Dec. 19, '53, p. 27). Those old RFC chemical loans ranged up to \$9 million, and the smallest was more than SBA's present maximum.

Chemical loans have been only a drop in the bucket in SBA's program thus far. In all, the agency has made 1019 business loans amounting to a total of \$55.2 million. Of that sum, \$30.5 million is government money; the remainder is private cash put up by local banks that are participating in 694 of the loans.

The agency has turned thumbs down on 1756 loan applications, had another 421 pending at latest count.

SBA is under fire from conservatives who feel that the government should not be competing with private credit sources, such as banks. The Administration is aware of this feeling; but even so the outlook next year is for an easier lending policy by SBA, with the Administration trying to counteract Democratic criticism.

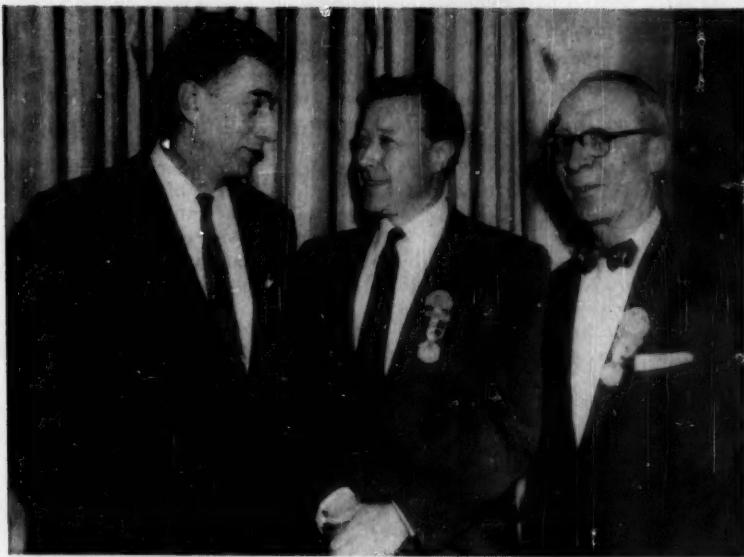
Business Loans and Ballots

Small chemical companies that haven't yet received business loans from the U.S. Small Business Administration can be confident that they'll still have a chance to get in on this help-the-little-fellows program, even though it now appears that SBA's \$80-million revolving fund won't last beyond February.

Because it's considered "good politics" to be friendly toward small business,

members of both parties in Congress will be striving to take the lead in helping SBA during the coming session. SBA officials are planning to ask for additional funds to keep their lending operation going until June 30, and there's little doubt that this money will be forthcoming.

Under the law that set it up to continue some of the lending functions previously carried out by the now de-



CIO'S SWISHER, REUTHER, KNIGHT: At Los Angeles, a preview of '55 unity.

Big Splash in Fadeout

Going into what may well be the last year of its separate existence, the Congress of Industrial Organizations is launching a series of drives that—for better or worse—are bound to affect this country's chemical companies.

Seldom has any organization laid such ambitious plans for the year in which it expects to be swallowed up by a larger group. Apparently hoping that its fadeout will be marked by its biggest splash in the North American economy, the CIO decided during its 16th annual convention—held last fortnight in Los Angeles—to bear down during 1955 on these goals:

- Merger with the AFL, to form the world's largest and most powerful labor federation.

- Guaranteed annual wages, with all major industries called on to set aside funds to supplement present state unemployment compensation payments for at least a year when workers are laid off.

- Lower tariffs to encourage freer international trade, except that "tariff reductions should not be destructive of basic American industries."

- Support for foreign aid programs, with an aim to raise the standards of living for industrial employees in other nations.

Oil-Chemical Union: One reason for chemical management to keep an eye on the CIO's one-week gathering was for hints about the predicted unification of the two CIO affiliates that have overlapping jurisdiction in the petrochemical field. No official action was

taken on this move during the CIO convention, but the fact that the officials most concerned were as chummy as the above picture indicates can be viewed as strong evidence that the unification plans still have official blessing. All three of the principal officers involved—CIO President Walter Reuther, President O. A. (Jack) Knight of the Oil Workers International Union, and President Elwood Swisher of the United Gas, Coke & Chemical Workers—have reiterated that they're fervently in favor of the proposal to weld the CIO's oil and chemical unions together.

This event probably will take place in Cleveland about March 1, and may be followed by more aggressive unionizing in these fields. Latest word from the unions: "Swisher's office is proceeding with a study of the chemical and allied industries looking toward an intensified organizational effort once the merger has been effected. The OWIU also is making a survey of the possibilities for organization in the oil and petrochemical fields."

On a broader scale, the 500 CIO delegates appeared to be serious, even determined, in their approval of the proposal to return their 19-year-old organization to the AFL.

The resolution on GAW declared that CIO unions would not back down in this drive, but promised industry that CIO would give "serious consideration to constructive suggestions from management regarding the implementing machinery."

Big Enough for Both

"The market is big enough for both of us" is the thinking behind last week's compromise between U.S. and Canadian natural gas interests—an agreement that holds growth and boom promise for chemical companies operating in the Pacific Northwest.

Signing of the agreement in Vancouver, British Columbia—a history-making event for all industry in the area—means that an integrated U.S.-Canadian pipeline network will be built to furnish all the natural gas wanted in Washington, Oregon and along Canada's Pacific Coast—providing that the U.S. Federal Power Commission approves the plan.

Up to now, Canada's Westcoast Transmission Co. and the U.S.'s Pacific Northwest Pipeline Corp. had fought each other for an exclusive franchise to supply gas for that rapidly industrializing area. After several years of controversy, Pacific Northwest finally got the nod from FPC (CW Newsletter, June 26); Westcoast moved to appeal that decision (CW, July 3, p. 13); and people out Seattle way began to wonder if the gas they wanted would ever get out of litigation and into the pipelines.

Under the compromise—which appears to be headed for FPC approval within a month—gas from Canada's Peace River fields will go to British Columbia, Seattle, and cities directly to the south along the coast, with surplus going into California. Gas from the San Juan Basin in Colorado and New Mexico will go into central and eastern Washington and Oregon.

A Rose by Any Name

What are the logical subdivisions—if any—for the U.S. chemical industry, whose plants are traditionally masterpieces of integration?

That's the problem facing the U.S. Bureau of the Budget, the agency that has charge of the government's standard industrial classification code, following last week's receipt of a set of recommendations from a chemical industry task force under Koppers Co.'s George Naylor.

Government statisticians hope to be able to test out these proposed classifications on parts of the chemical companies' returns in the 1954 census of manufactures, though the official data will be printed according to the present code. If the new system seems to work better than the present one, it will be adopted for future statistical work, but probably won't go into public use until 1957.

Importance of having a code that

will accurately reflect industry conditions is broader than you might think. Example: in a plant making sulfuric acid, a union might object that wages are below the average of the present "industrial inorganic chemicals" class; but it might be that other sulfuric acid producers presently grouped under "fertilizers" and other categories would bring that wage average down below the rates in the hypothetical plant.

Difficulty of drafting an accurate code can be illustrated in the case of a plant that makes chlorine, then chlorinates hydrocarbons, and ultimately turns out vinyl monomers—should such a plant be listed as a producer of inorganic chemicals, organic chemicals, or synthetic plastics?

EXPANSION . . .

Manganese: Electro Metallurgical Co., division of Union Carbide and Carbon Corp., has started production of manganese at Marietta, O. The plant is expected to have a capacity of over 6000 tons/year when in full operation.

Phosphoric Acid: Pennsylvania Salt Manufacturing Co. has brought its new phosphoric acid plant at Paulsboro, N.J. onstream. Designed to produce 25 tons/day of phosphoric pentoxide, the plant's output will be used primarily in making triple superphosphate.

Lithium: A large-scale mining operation that could make Canada one of the world's major suppliers of lithium is now under way in northern Quebec. Officials of Quebec Lithium Corp. say they plan to spend upwards of \$2.5 million to get the mine into production early next year. Output (according to terms of an agreement signed last June) will be completely turned over for the next five years to Lithium Corp. of America.

COMPANIES . . .

Beginning Jan. 1, Wallace & Tiernan, Inc. (Belleville, N.J.) will operate W. C. Hardesty Co., Inc. (Dover, O.) as the Harchem Div., Wallace & Tiernan.

Effective date of the merger of the Dorr Co. (Stamford, Conn.) and Oliver United Filters (Oakland, Calif.) under the name Dorr-Oliver, Inc. will take effect on Jan. 1. Headquarters of the new corporation will be in Stamford.

A four-for-one stock split has been decided by H. K. Porter Co., Inc. (Pittsburgh). Company stockholders will receive three additional shares for each

single share now held; the number of total shares outstanding will be increased from 259,650 to 1,038,600. Effective date: Dec. 27.

The Sabre Uranium Corp. has purchased all assets of the Plateau Uranium Mining Corp. for \$40,000 cash plus 545,000 shares of Sabre common stock.

An agreement has been signed by Anglo-Lautaro Nitrate Corp. with Chile providing for "elimination of unrealistic exchange rates" between the Chilean peso and the dollar. Under terms of the pact, Anglo-Lautaro will accept a solid exchange of about 200 peso to the dollar, which would cut operating costs and lift revenues that may be taken out of Chile. The Chilean Congress must ratify the agreement to put it into effect.

Continued silence on the part of the Ecusta Paper Corp. over its plans to

build a cellophane plant on the Sacramento River in California in view of restrictions set up by the Central Valley Regional Water Pollution Control Board is causing official state worry. Governor Goodwin Knight last week sounded the alarm in saying "it appears that the corporation is hesitant about building the plant at Red Bluff because of unfavorable public opinion. California, however, needs industrialization . . . should make every effort to facilitate its establishment."

More company incorporations—all filed in Dover, Del., with authorized capital stock:

- Isthmus Sulphur Co., \$300,000.
- Shoshone Sulphur & Exploration Co., Inc., \$500,000.
- Sulphur, Inc., \$1000.
- Canadian Holly Uranium Corp., \$300,000.
- Langford Uranium Corp., \$10 million.
- Pharmaceutical Corp. of America, 4000 shares, no par value.



Big Switch for Santa

HERE'S A CHEERY SCENE that may well be enacted on many a countryside this Christmas morn. According to one leading supplier, more little Geiger counters that "nose out" uranium have been bought for Christmas this year than

ever before. Most popular model for children is about the size of a miniature camera, and some of the more expensive instruments have sizes, styles, and prices as varied as Christmas toys. Big selling pitch: it's healthful, can be profitable.

AN AA QUALITY PRODUCT



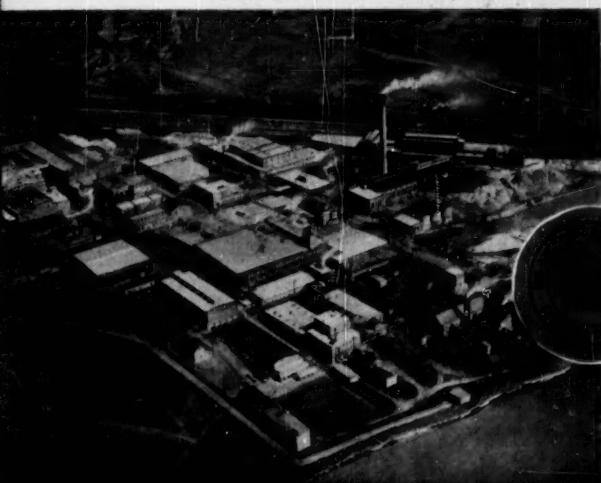
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Magnesium Fluosilicate • Potassium Fluosilicate
Sodium Fluosilicate • Zinc Fluosilicate
Fluosilicate Mixture • Ammonium Fluoborate
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barrels and

mining



Full of Yule Cheer

IMBUED with spirit of Christmas cheer, chemical companies from coast-to-coast this week are admiring their Yuletime decorations.

Displays range from Humble Oil & Refining Co.'s giant 310-ft. greeting topped with a Texas lone star (*above, left*) to General Chemical's more modest but time-honored message to employees and passers-by at Marcus Hook, Pa. (*above, right*). Humble's display contains 800 red, blue, green and yellow bulbs strung over more than 16,000 ft. of wire; its star is 6 ft. across.

Sinclair Refining's Christmas tree (*right*) this year is built of steel tubes, stands at a height of 200 ft. aboveground, can be seen for many miles in all directions.

Carbide and Carbon Chemicals Co.'s South Charleston plant on the other hand is featuring a series of seasonal tableaus . . . such as the Santa Claus-reindeer scene (*below*).

On the whole, decorations this year are brighter, more spectacular, tend to play up the childhood-Christmas stories.

Numbers of companies are holding open-house parties for employees' children, and children from local homes and orphanages. Christmas trees, as of yore, will be donated to local charitable organizations; more than one chemical firm is organizing group teams to visit hospital wards on Dec. 25. In all, a very merry Christmas.





MEETING WITH WIVES of department heads, Vice-President Thome explains general policy decisions . . .

What Goes On at the Office?

One of the time-worn problems facing small chemical companies is that of holding on to its top management personnel. Not only is rapid turnover often a vital waste of time and investment, but its effect on morale can be devastating.

Acheson Dispersed Pigments Co. (a small Philadelphia concern that plans to break ground in Orange, Tex., next week for a new pigments plant) seems to have struck on a novel scheme to help handle the situation, however. Its theory: explain the importance of the company and its functions to the wives of management officials, and you cut your management turnover immediately.

Meeting with department head's

wives in Philadelphia's Hotel Warwick recently, John S. Thome, vice-president and general manager, outlined the system. Husbands are invited to sit in on the affair, but have nothing whatsoever to do or say.

Thome covers (1) general status of Acheson's business, (2) its plans for the future, and (3) policy decisions that have recently been made or are about to be made. Emphasis is placed on just what function each department head has in the team; Thome makes a special effort to encourage informality and questions.

"It's remarkable just what effect our meetings have," he notes. "One of the misunderstandings that's apt to rise when a small company makes a

major expansion move, is that the new policy will cause upheavals in the home office. You can convince your management that it isn't so, but you can't convince them forcefully enough to satisfy their wives."

Thome wanted to avoid that type of thinking if possible, found that when he explained the expansion maneuver (stressing that the new Texas plant won't endanger or interfere with management in Philadelphia) to management's wives, dissent slowed to a trickle.

Explanations involving advertising were even more effective. Wives were asked to vote on whether they'd choose realistic (child playing with plastic toys for which Acheson makes



FOLLOWING THE AXIOM, 'There's nothing like everyday example,' he shows samples of dyes-in-tablecloths, pens, maps . . .



goes over company's business status, explains use and function of various types of advertising media.

the pigments) illustrations or abstract sketches to show what color means in everyday living. An on-the-spot tally revealed that the women preferred a middle-of-the-road type of illustration—which happened to be the one the company had already selected. (Editors' note: delighted smiles all around.)

Concrete Examples: Trying to drive home the company's part in everyday living, Thome admits, isn't always easy. But Acheson special vinyl rotogravure ink is now being used in a plastic globe soon to come on the market—for which there's a crying need in public schools. And shower curtains and plastic toys are made-to-order items to display the company's products.

"Part of the trick of getting your message across," admits Thome, "is utter candor." And sometimes, in the face of direct questions, it isn't easy.

Queries are prone to run the gamut—from the strictly practical ("In what form are the pigments when they're shipped out to plastic manufacturers?") to the purely theoretical ("What does Acheson gain from its advertising campaigns and how can it evaluate it?").

One wife, at the company's most recent meeting, demanded (and got) a direct answer on the question of toxicity of plastic toys. Another wanted to know Du Pont Co.'s relation to Acheson, what the small chemical company can hope to do in competition with industrial giants. A third was obsessed with the shower curtain exhibition, asked a flurry of questions about Acheson's work with polyethylene, and "how a shower curtain gets its satiny appearance." Other topics: retirement and medical plans.

Wife of the company's sales man-

ager asked what part Acheson inks play in the writing-consumer ink market. Thome's reply: "Nothing, but the company is working with the Parker Pen Co. on a ball point pen ink . . . a concentrated ink."

The production manager's wife wanted to know about business conditions . . . how the company is doing financially. Thome's answer: "Business in the third quarter of 1954 topped any quarter in Acheson's history; October was the biggest single month, and the final quarter of the year looks even better."

Impressed with the first results of the meetings, Thome hopes to extend the idea down to a lower echelon of management soon. "It's just human nature," he says "that interested employees make the best employees. And what better way to encourage interest than to foster it at home?"



. . . insists that during the question-answer discussion men keep discreetly in the background.



SECRETARY MITCHELL: In cabinet showdown, he looks like probable winner.

LABOR

Seeking Ike's Backing: Recent pronouncements by Secretary of Labor James Mitchell point up the decision that the Eisenhower Administration will have to make soon on labor law recommendations to the 84th Congress. Within the cabinet, Mitchell is trying to get the President's support for certain measures and Secretary of Commerce Sinclair Weeks is seeking the President's backing in opposition.

Among Mitchell's controversial proposals:

- That the federal minimum wage be increased from its present level of 75¢/hour—possibly to around 85¢ or 90¢—and that coverage be widened to include another 2 million wage earners.
- That the Taft-Hartley law be amended to make it more acceptable to labor unions.
- That the Administration crusade against the so-called "right-to-work" laws—now in effect in 17 states—possibly by means of a federal law that would specifically permit labor unions to negotiate contracts providing for compulsory union membership.

Mitchell, speaking for the Administration, already this month has urged all state governors to try to have their legislatures increase the amount and duration of unemployment compensation benefits. Washington observers are predicting that while Mitchell

won't be able to get all he wants on labor policy, he'll get more Presidential support than will Weeks.

Christmas Greetings: This is the season for Christmas bonuses, and one chemical company that has built up a tradition along that line is Diamond Alkali, which late last week distributed to all employees a gift computed at 2½% of earnings for the past 12 months. This is the 19th consecutive year that Diamond has made a cash Christmas gift to each employee. The bonus also is being mailed to all employees who entered military service during the period Dec. 1, '53, to Nov. 30, '54.

Controls No Excuse: More widespread use of automatic controls is not an excuse for labor unions' current campaign for guaranteed annual wage contracts, asserts the Chamber of Commerce of the U.S. "You can assure your employees that they'll be among the first beneficiaries," the Chamber adds. "Automatic machines will increase everybody's living standard, not through pump priming but through an increase in productivity. There'll be more, better, and new products and services; and they'll be cheaper." The chamber quotes the late CIO President Philip Murray as denying that any great technological gain in the U.S. has actually made people jobless.

LEGAL

Freedom to License: A patent holder may not conspire with other persons to use that patent as a means of limiting competition, but—acting by himself—he's free to grant licenses under that patent or to refuse to grant them. That's the nucleus of Judge Richard Rodney's dismissal of the government's antitrust suit over alginate dental impression material in U. S. District Court at Wilmington, Del.

In throwing out the charges, Judge Rodney noted that while it appeared that the defendant companies had refused to grant certain requests for sub-licenses under the 1941 Wilding patent, he found "no unlawful confederation or conspiracy on the part of the defendants to violate the Sherman Act." He said the defendants' action stemmed only from "a desire to protect those rights that have been given under the patent laws of the U.S."

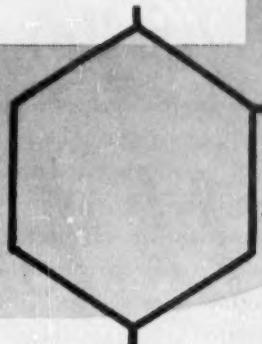
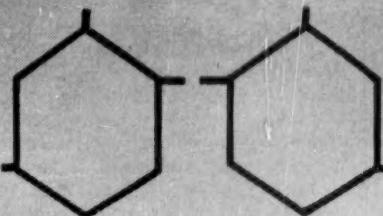
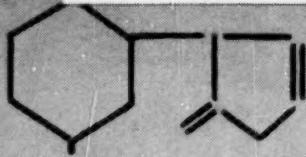
The suit was filed several years ago against L. D. Caulk Co. (Milford, Del.) and Coe Laboratories, Inc., Dental Perfection Co., and Stanley E. Noyes (all of Wilmington). There was no argument about what had happened in the companies' patent dealings; the government and the companies stipulated the facts and left it up to Judge Rodney to determine whether the law had been violated.

Bureaucratic Wedge: Illinois' Gov. William Stratton has jumped into the fight for nullification of last June's Supreme Court decision that the Federal Power Commission has authority to regulate wholesaling of natural gas



GOV. STRATTON: In federal control, he foresees chaos and destruction.

Du Pont offers you the widest variety of
INTERMEDIATES



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BENZENE DERIVATIVES—o-Anisidine Technical; 2,4-Dinitrochlorobenzene Technical; 4-Aminoazobenzene hydrochloride Technical; m-Phenylenediamine Technical.

TOLUENE DERIVATIVES—5-Chloro-2-Aminotoluene hydrochloride Technical; Dinitrotoluene Mixture Technical; 2,6-Dichlorobenzal chloride Technical; o-Tolidine Technical.

NAPHTHALENE DERIVATIVES—Naphthalene-1,5-disodium sulfonate Technical; Neville and Winther's Acid Technical; Sodium naphthionate Technical; beta-Naphthylamine Technical.

**Specific intermediates also produced—
perhaps we can make the one you need**

When it's a question of "which intermediate" or "where to get it," take a close look at the list of Du Pont Intermediates. Here is the widest variety offered by any chemical company, and the exact compound you need may well be among them.

If not, it will pay you to get in touch with our technical service men. We have the facilities to produce "custom-made" intermediates and may be able to make the one you want. Our service men are always ready to help you on your problems, or to work with you in product development. No obligation, of course.

Write us on your company letterhead for additional information about intermediates and technical service available. E. I. du Pont de Nemours & Co. (Inc.), Organic Chemicals Department, Dyes & Chemicals Division, Wilmington 98, Delaware.



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BUSINESS & INDUSTRY

by independent producers. At the recently held winter meeting of the Interstate Oil Compact Commission, Stratton warned that federal bureaucratic control now has "driven its entering wedge" into the gas and oil industries, causing "chaotic conditions" now and threatening "destruction of reasonable regulation under state statutes." The aim of those opposed to FPC control is to have Congress enact a new law specifically exempting the gas producers.

Fifth Amendment Used: In their continuing probe into the explosion at the Charles W. Berg Laboratories two months ago, Philadelphia officials have run into two refusals to testify. On advice of counsel, the owners of the chemical plant invoked the Fifth Amendment to the Constitution on grounds of possible self-incrimination.

Against the advice of his lawyer, company chemist Thomas Black answered questions as directed by Medi-

cal Examiner Joseph Ominsky, conducting the public hearing. Black testified that the laboratory owners had not consulted him about how to keep clean the aluminum tank that exploded, killing 10 firemen.

Contract, Accidents: Among lesser lawsuits pending this week against chemical companies:

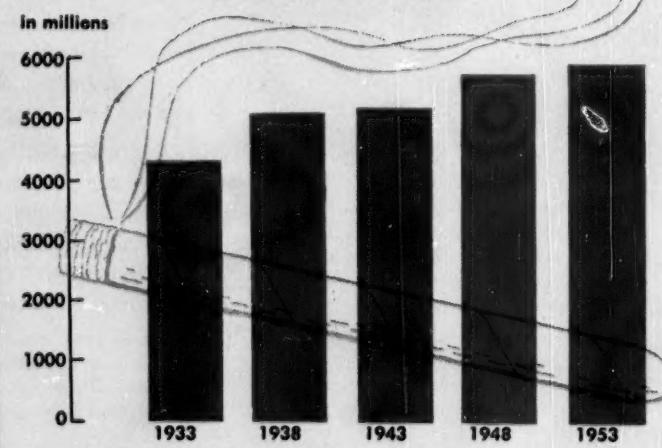
- At Bartow, Fla., a truck driver has brought suit against American Agricultural Chemical Co., asking \$100,000 for injuries allegedly sustained in an accident four years ago.

- Another \$100,000 suit is the breach-of-contract action being tried at Roanoke, Va. The suit was filed by Allen Tiedman and Victor Mercaldi of New York against American Pigment Corp.

- A resident of South Charleston, W. Va., is suing Union Carbide and Carbon Corp. for \$30,000. He alleges that he was injured when struck by a truck driven by a man employed by Carbide and Carbon Chemicals Co.

IMPACT

PREFERENCE FOR CIGARS PUFFS UP CHEMICALS



Mellow Markets for Chemicals

AIDED in part by adverse cigarette "cancer scare" publicity, cigar sales are soaring, should top 7.5 billion units by 1960. And that's good news for various sectors of the chemical industry. One billion cigars require about 1 million lbs. of cellophane, 7.2 million lbs. of card-

board pulp boxes (rapidly replacing wooden boxes), 12,300 lbs. of gum tragacanth and 81,000 lbs. of animal glue—for sealing and labeling the package. Moisture-retaining agents (such as glycerine or sorbitol) are also used in substantial poundage.

A new star on the chemical horizon **NITROPARAFFINS**



In the starred area above, construction has started on the new five million dollar plant for the commercial production of the Nitroparaffins and their remarkable family of derivatives. The new plant, the first major step in the company's Nitroparaffin expansion program, is expected to go on stream August 1955.

Located at Sterlington, Louisiana, the new plant is surrounded by CSC's great petrochemical facilities, from which such useful and basic products as methanol, ammonia, and nitric acid flow to all industry. In addition to the new NP plant, existing facilities at Peoria, Illinois, are being expanded.

Virtually laboratory curiosities a few years ago, the

Nitroparaffins have been under study since 1935 in a continuing program of experimental production and evaluation. The four Nitroparaffins and six derivatives, which have already been produced and been proven useful in a wide range of applications, represent only a small fraction of the total number of derivatives under current investigation. The new chemicals represent a unique field of organic chemistry and hold unusual promise for virtually every industry.

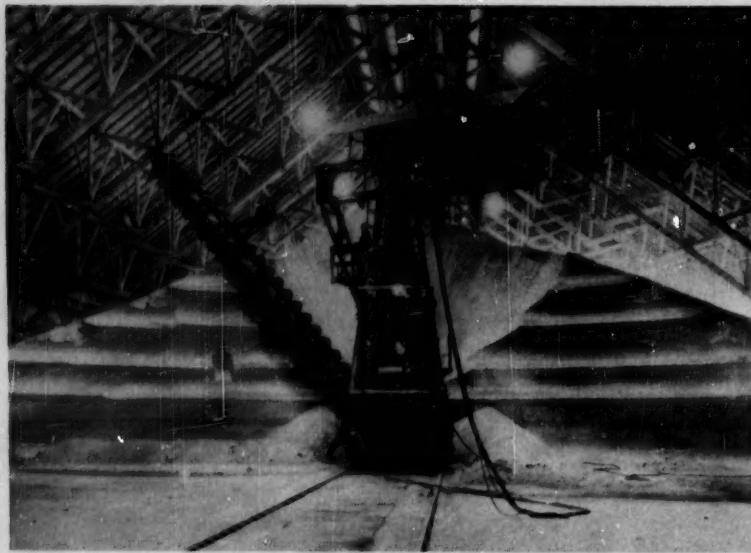
The experience of Commercial Solvents Corporation in evaluating these versatile chemicals is available on request to every manufacturer.



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LINZ NITROGEN WORKS: Due for product diversification soon.

FOREIGN

Urea/Austria: The Linz Nitrogen Works of Upper Austria Province will build a 10,000-metric-ton urea plant alongside its present ammonia facilities. To cost over \$1 million, the plant will use company-produced ammonia as its base, estimates it can sell urea about 10% cheaper than present fertilizers sold in Austria.

Petrochemicals/West Germany: West German production of petrochemicals is expected to make rapid strides within the next year owing to increased availability of refinery products and natural gas. But output of these products will still remain small when compared with the volume of chemicals that are produced on the coal-acetylene basis. Reason: West German reserves of coal are still large, relatively cheap.

The following firms are already in petrochemical production, however; three of four others are expected to swell the ranks early in 1955.

- Napthenic acids are now being produced by the Deurag-Nerag refineries near Hanover, the German Shell Works (Hamburg), the Wintershall Oil Co., and Gelwerke Julius Schindler (Hamburg).

- The Rheinpreussen Co. in the Ruhr is using refinery gas from the Wesseling hydrogenation plant, the BP (Anglo-Iranian) and Deurag refineries to manufacture isopropyl alcohol, butyl alcohol and alkyl benzol. Total annual output: 3500 tons of alcohols, 2000 tons of alkyl benzol.

- Chemische Werke Huels, near

Duesseldorf, is processing 300 million cu. meters of natural gas from the Emsland oil fields, refinery gas from the Gelsenberg and Scholven hydrogenation plants, and about 12,000 tons/year of butane from the Deutsche Vacuum refineries near Bremen. Huels uses the electric-arc method to produce acetylene, ethylene, and propylene, processes about 40,000 tons/year of benzol. The company has also recently set up a pilot plant for test production of aromatics.

- The Phenolchemie GmbH (Gladbeck, Westphalia) has recently started production of phenol and acetone at a rate of 8000 tons of phenol, and 5000 tons/year of acetone. Raw materials (benzol and propylene) are supplied by the Scholven hydrogenation plant. Equal shares in the company are owned by Bergwerksgesellschaft Hibernia A.G. (Herne), Ruettgerswerke A.G. (Frankfurt), Scholven-Chemie (Gelsenkirchen-Buer), and Herpener Bergbau-Aktien-Gesellschaft (Dortmund).

- Rheinische Olefinwerke (Wesseling, in the Ruhr), is building a plant to process refinery gases and produce polyethylene and ethyl benzol. Production is scheduled to start early in 1955.

- Ruhrbau GmbH (50% owned by Farbenfabriken Bayer at Leverkusen) plans to build an ethylene plant using crude oil topping residues at its raw material.

- Knapsack-Griesheim AG (Frankfurt) is working on drafts of a plant to use propylene in the production of isopropyl alcohol.

- Farbwerke Hoechst (near Frank-

furt) is planning to use 4-5 million cu. meters of natural gas annually (supplied by pipeline from an oilfield near Darmstadt) to produce methyl chloride, chloroform, carbon tetrachloride, and other solvents, is also reported to have successfully tested production of ethylene, using crude oil as its raw material.

Fertilizer/India: The Indian government has established a Fertilizer Production Committee to consider and make recommendations on capacity expansion for the production of nitrogenous fertilizers. The committee will study suitable sites for the proposed fertilizer plants (now estimated as four in number), will determine the quantities of fertilizer that can be produced most economically at each location, and probable cost of production.

The government is reportedly pressuring for a cut in the ammonium sulfate price, in particular.

Ferro-Alloys/Philippines: Maria Cristina Chemical Industries' multimillion-peso carbide and ferro-alloy plant in Manila has started operations. First of its kind in the Philippines, the plant has a rated capacity of 27 tons per day. Its furnace was designed and constructed by the Norwegian firm, Elektrokemist A.C.

Front Door, Back Door

With imports of coal-tar chemicals into the U.S. "increasing steadily," the U.S. chemical industry is taking the strong stand expected of it in the tariff hearings that started in Washington last week (CW, Dec. 11, p. 14). These hearings—one by the Tariff Commission and one by the interagency Committee for Reciprocity Information—bear directly on the proposal to boost Japan's economy by cutting U.S. tariff rates on some 400 items ranging from fireworks and pharmaceuticals to rayon and resins. But a number of industries not directly vulnerable to Japanese competition are worried, because the Administration proposes to give tariff concessions on numerous commodities to third countries in exchange for concessions from them to Japan.

Tariff concessions to third countries are being considered, for example, on a long list of coal-tar intermediates. This has domestic producers up in arms; the industry fears that its ancient rival—the German chemical concerns—may sneak into the U.S. market through the back door while the front door is opened for Japanese goods.

Defense Needs Cited: Speaking for the domestic producers last week was

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YOU NATURALLY WANT
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NITROGEN PLANT. WORLD'S
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If purity is important to you—and it is in most industries—why specify anything but the best...especially when the best costs no more?

(An interesting highlight: Our Hopewell, Va. plant was *America's chief source* of high purity Nitrogen during the war, while Government plants were being built.)

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B & I

Du Pont's Samuel Lenher, new president of the Synthetic Organic Chemical Manufacturers Assn. "The products being considered for trade agreement negotiations with Japan and other countries," Lenher noted, "include a large group of coal-tar chemicals essential to defense production. Production of these items is below the annual capacity required under defense mobilization goals.

"The tariff was sharply cut on these items in 1951 (from 7¢/lb. and 40% ad valorem to 3½¢/lb. and 25% ad val.), and imports are increasing steadily (from \$2 million in 1952 to about \$5.7 in 1954). From 1950 to 1953, imports of all intermediates from Japan have increased from 0 to \$161,000; from England, \$664,000 to \$1,420,000; from Germany, \$363,000 to \$4,110,512. Further reductions in duty are obviously unnecessary to increase imports."

The hearings—scheduled to end late this week—probably will go down as the hottest in tariff cutting history. Japanese competition is no paper dragon to many of the industries making appearances; and on many items, the Administration could cut duties as much as 75%—potentially a life or death margin for a number of U.S. industries.

KEY CHANGES . . .

John A. Morgan, to vice-president and general manager, Western Div., Glass Fibers, Inc., Toledo, O.

John A. Field, to vice-president, Carbide and Carbon Chemicals Co., New York City.

Frank N. Youngman, to president, and **Robert H. R. Young**, to vice-president and general manager, Crown Zellerbach Canada, Ltd.; **Reed O. Hunt**, to vice-president, operations, and **Peter T. Sinclair**, to vice-president, manufacturing, Crown Zellerbach Corp., San Francisco.

Donald E. Weaver, to treasurer, Carlton Products Corp., Cleveland.

James M. Dawson, to director, Ferro Corp., Cleveland.

Otto F. Sieder, to vice-chairman of the board, and **Wells N. Thompson**, to president, H. K. Ferguson Co., Cleveland.

Robert B. Coons, to director, American Potash & Chemical Corp., Los Angeles.

Wilbur E. Binder, to vice-president, trading, The Stidden Co., Cleveland.

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Men who know hydrides best . . . pioneers for seventeen years in their manufacture and application . . . are at your service. The Metal Hydrides sales staff will gladly show how this new service can be profitably and promptly applied to take your developed process from the laboratory to commercial production. Write, Wire, or Phone today! No obligation, of course.



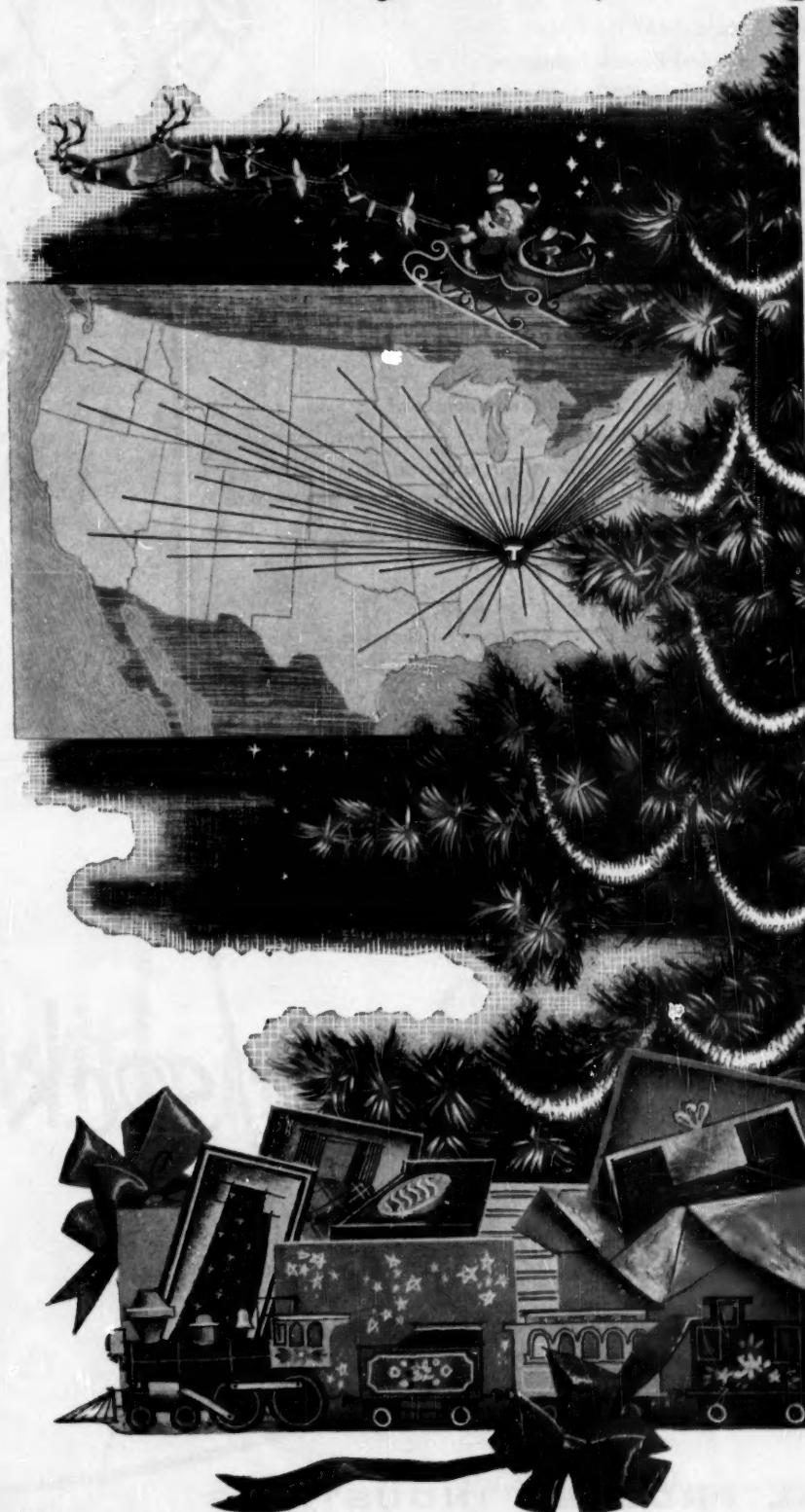
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across the nation whose
business has made
Tennessee Products
what it is, and to the
millions of Americans
they serve—Best Wishes
for a Happy
Holiday Season.



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It's the season! And who's got a better right
to whoop it up than sellers to the Chemical Process Industries.
The way this market delivered the goods in '54 is reason a'plenty for cheering.

Here in the CPI the gloom peddlers never had a chance.
Process companies shook down fast, chemical engineers kept building
and buying and popping up with new products . . .
right now they're coming down to the wire with one of the hottest
12 months on record. Output's crowding last year's \$59 billion peak . . .
raw materials, fuels and power cost \$35 billion . . . new plants
and equipment edged \$6 billion to make 'em industry's
biggest spender eight years in a row.

They hung up a good one! But there'll be no pause at the punch-bowl
for the chemical engineer. He's got too much on the fire
in product development, expansion plans, another big output bump in '55.
He wants new tools . . . better raw materials, improved packaging and handling systems,
more facilities to lick corrosion, air and stream pollution.
They're saying "gimme" all over this demanding market.

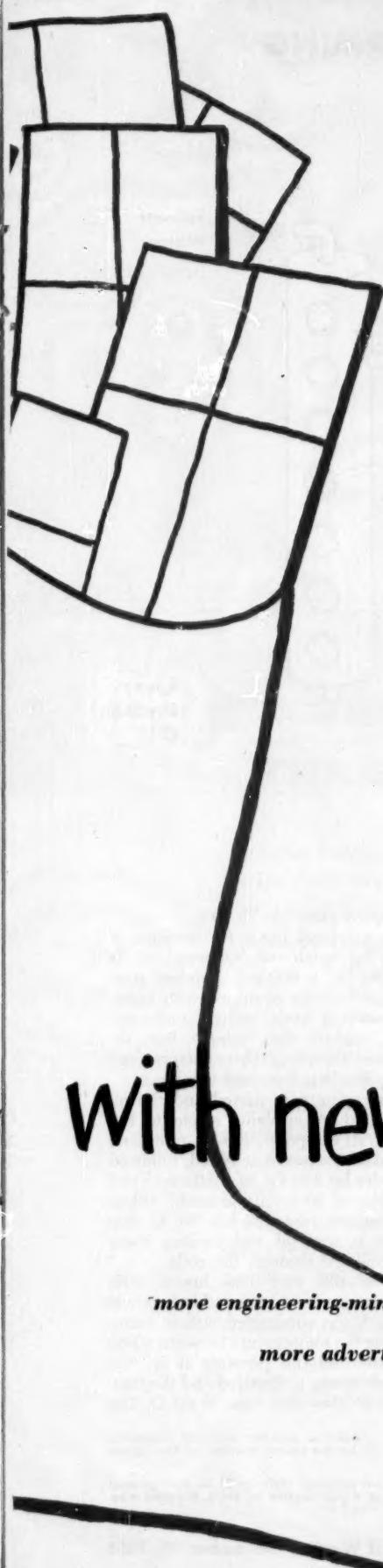
Shuck that stocking! You'll fill it with orders when you get to know
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your product in **CHEMICAL ENGINEERING** in profit-generating company like . . .
Watch Those Hidden Packaging Costs—New Ball Mill Grinds Faster—
Pick Valves To Fight Corrosion. Soon you'll say . . .

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how to pack your sock



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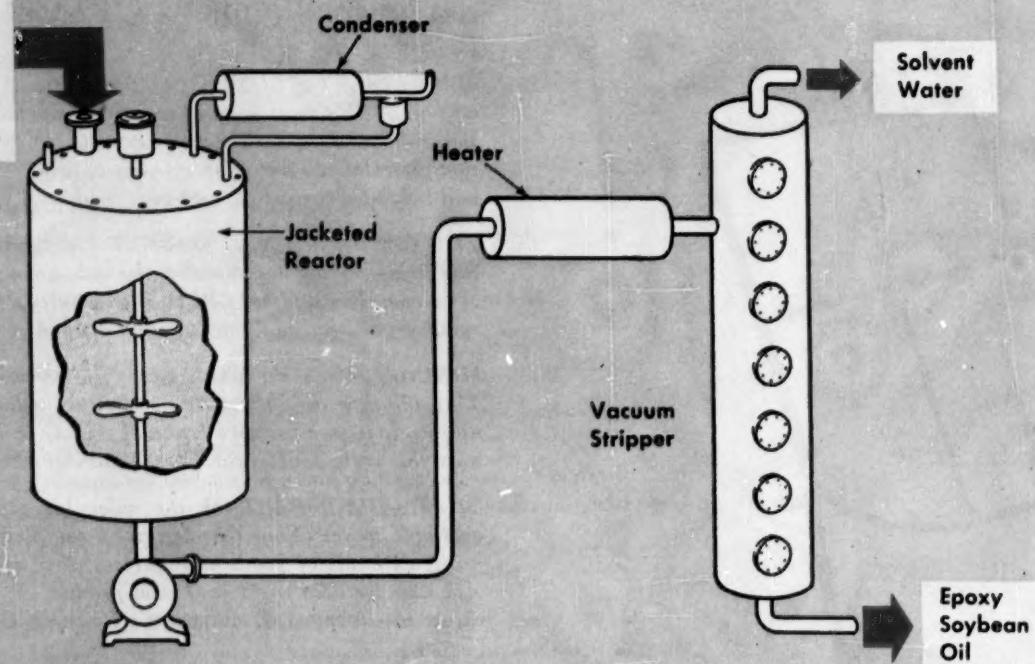
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NEW EPOXIDATION: NO PREFORMING

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Streamlined for Convenience

Epoxydation as a chemical process is being pushed by several groups: firms like Du Pont and Buffalo Electro-Chemical see it as a means of broadening the market for their hydrogen peroxide; the U.S. Dept. of Agriculture* hopes that it will melt the mountain of current surplus fats and oils; other companies, of course, are eager to exploit the surpluses to make valuable chemicals such as plasticizers, insecticides, stabilizers and resin coatings. Among them: Rohm & Haas, Archer-Daniels-Midland, General Mills and Borden.

Epoxydation of fats is already a commercial reality, but peroxide makers have felt that present processes, based on acetic acid and hydrogen peroxide, leave room for improvement. An *in situ*, one-stage process, they felt, would be much more attractive economically. Du Pont developed such a method last summer (CW, Aug. 21, p. 100). Buffalo Electro-Chemical, too, had a process, but hasn't publicly discussed details until now. Here's how it's done:

Easier by Half: In an earlier version

* Whose Eastern Regional Research Lab did the early work on it.

of the process, the first step was the formation of peracetic acid. This involved reacting glacial acetic acid and hydrogen peroxide in the presence of 1% sulfuric. In a large-scale operation, some provision had to be made for the recovery of the acetic acid.

Production men had long realized the advantages of a one-step epoxidation process—based on acetic acid and hydrogen peroxide. This, however, was easier said than done, for the same conditions—presence of mineral acid catalyst and high temperature—that favor *in situ* formation of the oxidizing agent also open up the epoxy ring.

Delicate balancing of reactions finally solved the dilemma for Becco. The process utilizes a controlled low-molar ratio of acetic acid to hydrogen peroxide at reaction temperatures above 60 C, with the peroxide measured out in approximate stoichiometric quantities. A strong acid catalyst—sulfuric acid, an organic acid (alkane sulfonic acid), or a sulfonic acid type cation exchange resin (Amberlite IR-120, Dowex 50X, Permutite Q), which can be reused—is employed. Yields of

the epoxy ester run 75-90%.

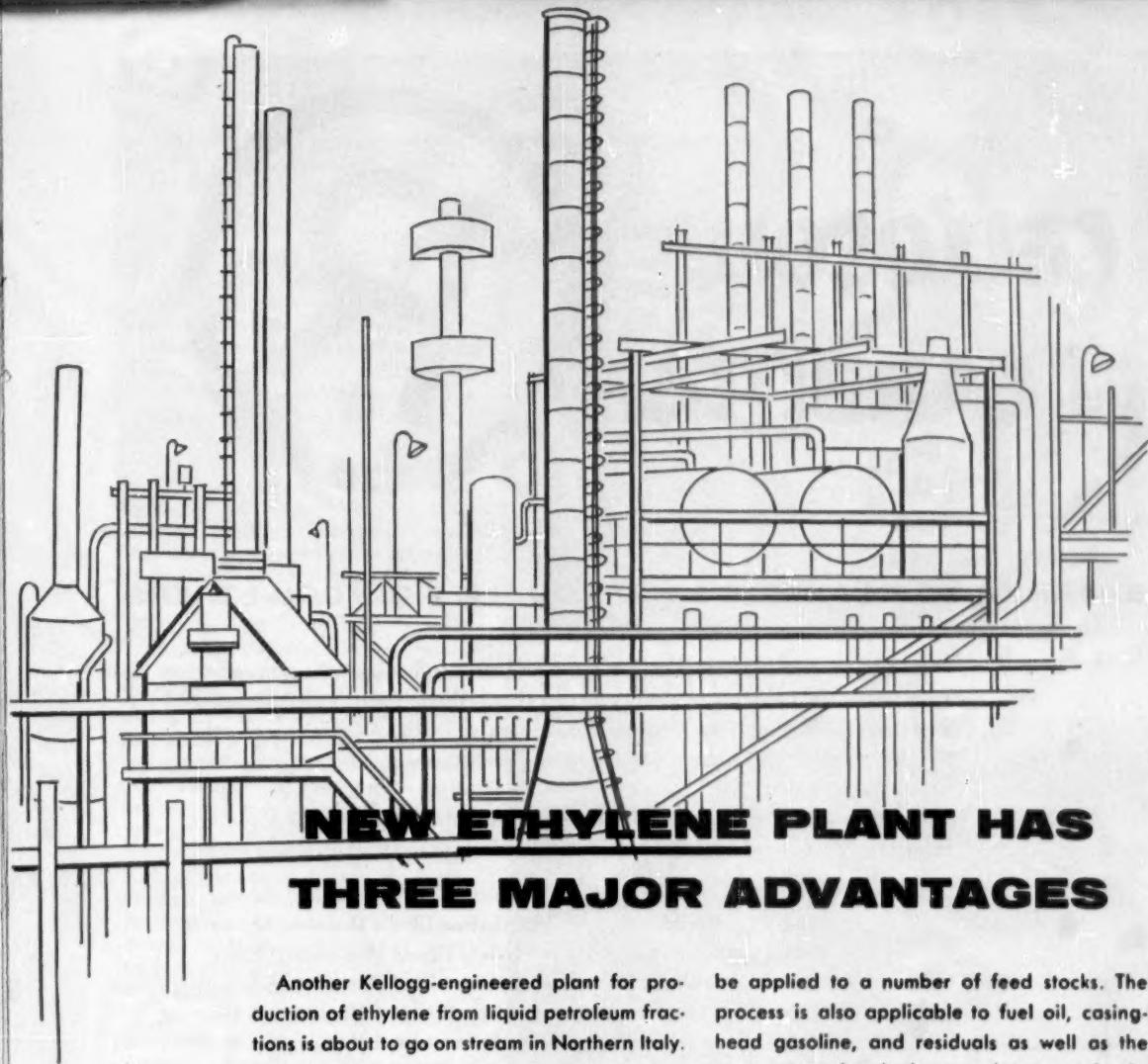
In a typical run,† for instance, a 2000-lb. batch of soybean oil is charged to a 600-gal. stainless steel jacketed reactor equipped with agitator, cooling coils, reflux condenser, vent, rupture disc, sample line, direct and recording thermometers, feed lines, flooding line, and manhead.

The agitator is started and the oil is heated by applying steam to the jacket. At this point, 400 lbs. of hexane (used as a solvent) is added, followed in order by 320 lbs. of acetic acid and 796 lbs. of 50% sulfuric acid.* When the temperature reaches 50 C, the steam is shut off and cooling water is circulated through the coils.

Over the next two hours, 50% hydrogen peroxide is added slowly through the constricted orifice, maintaining the temperature between 50-60 C. After all the peroxide is in, the cooling water is throttled and the temperature allowed to rise to 60 C. The

† The conditions selected are not necessarily those giving the fastest reaction or the highest yield.

* An ion exchange resin could be used as catalyst but would require an extra filtration step.



NEW ETHYLENE PLANT HAS THREE MAJOR ADVANTAGES

Another Kellogg-engineered plant for production of ethylene from liquid petroleum fractions is about to go on stream in Northern Italy.

It has three major advantages:

1. High olefin yields
2. High product purity
3. Flexible operation

In this process, Kellogg's engineers applied the principle of high temperature pyrolysis of hydrocarbons in the presence of steam to petroleum fractions with a resultant increase in yields of desirable products and reduced coking.

While in this particular instance, the processing sequence involves the topping of crude petroleum and pyrolysis of the heavy naphtha and gas oil cuts, the cracking operation can

be applied to a number of feed stocks. The process is also applicable to fuel oil, casing-head gasoline, and residuals as well as the more conventional ethane and propane feeds.

Developments such as this are the goal of "Engineering for Tomorrow" . . . typical of Kellogg's continuous efforts to prove out new ways to better yields, bigger profits.

TYPICAL RECENT KELLOGG CHEMICAL PLANT CONTRACTS are in the fields of:

ethylene • polyethylene • phenol-from-cumene
anhydrous ammonia • methanol • phthalic anhydride
liquid fuels and chemicals synthesized from coal
glyceride purification • nitric acid
ammonium nitrate • ammonium sulfate

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If you are considering glycol-ethers in your production, why not check the list below. There may be one or more high quality products to suit your particular needs.

CELLOSOLVE Solvent	Ethylene Glycol Monoethyl Ether
CARBITOL Solvent	Diethylene Glycol Monoethyl Ether
Methyl CELLOSOLVE	Ethylene Glycol Monomethyl Ether
Butyl CELLOSOLVE	Ethylene Glycol Monobutyl Ether
Methyl CARBITOL	Diethylene Glycol Monomethyl Ether
Butyl CARBITOL	Diethylene Glycol Monobutyl Ether
2-Ethylbutyl CELLOSOLVE	Ethylene Glycol 2-Ethylbutyl Ether
n-Hexyl CELLOSOLVE	Ethylene Glycol n-Hexyl Ether
n-Hexyl CARBITOL	Diethylene Glycol n-Hexyl Ether
Phenyl CELLOSOLVE	Ethylene Glycol Monophenyl Ether
Phenyl CARBITOL	Diethylene Glycol Monophenyl Ether

A FEW OF THEIR MANY USES:

- Solvents in surface coatings
- Solvents in dyestuffs, wood stains, and inks
- Mutual solvents in soaps, oils, and insecticides
- Diluents in brake fluids
- Intermediates for plasticizers

If you want more information on the uses, delivery, or prices of these high quality glycol-ethers, call the CARBIDE office nearest you. A technical representative will be glad to help you. In Canada: Carbide Chemicals Sales Company, Division of Union Carbide Canada Limited, Toronto.

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CHEMICALS

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PRODUCTION

temperature is held between 60-65 C until the reaction is complete as shown by titration for residual peroxide.

Agitation is stopped, the batch is allowed to settle for 20 minutes, and the lower aqueous layer is pumped to an overflow tank. To the reacted crude, 150 gal. of water is added; the solution is agitated for 5 minutes at 40-50 C, allowed to settle for 20 minutes, and again the lower aqueous layer is pumped to the overflow tank. This step is repeated until the crude has received a total of five washes.

The washed crude is then pumped to a vacuum stripping column; water traces and solvent are removed at 15 mm. and 50-60 C. Product is drawn off, filtered, and piped either into shipping drums or to storage. Virtually quantitative yields are obtained of the oil running 75-90% epoxy ester.

Flexibility Factor: One of the principal attractions of the process, declares Becco, is its built-in flexibility. In addition to the choice of catalyst and raw material, the operator can, if he wants, use a solvent, vary reaction time (from 1 to 14 hours) and temperature. As far as the catalyst is concerned, there are pros and cons to be noted for each system. With polyunsaturated esters such as soybean oil, higher epoxy conversions are obtained with the ion exchange resin catalyst; but, says Becco, with monounsaturated esters such as peanut oil there is little difference in various catalyst systems.

Also, recovery of acetic acid is not necessary to make the process economically sound since little is used in the first place. Among the other advantages Becco sees for it:

- Costs are lower—approximately half those of the preformed operation where the producer makes his own peracid, even lower if he buys it.

- High conversions into epoxide are achieved with approximately theoretical use of hydrogen peroxide.

- Handling and storage of the preformed peracid is eliminated. At low temperature, stability of peracetic acid is good, but it lessens quickly at elevated temperatures. It is considered more flammable than acetic, and prolonged heating of concentrated solutions at high temperature can result in explosions. In high concentration, it is highly corrosive.

Still unsolved, however, is the problem of continuous operation. The present process is strictly a batch operation, but, declares Becco, gives promise of becoming continuous. Along with this study, the company is also carrying on development work on *in situ* epoxidation processes in general, including those based on other acids.



POWER PURPOSE: Students learn to evaluate absorption capacity of metals as training for operation of atomic power stations.



ATOM SCHOOL: First class of 'students' from industry gets briefed on atomic power at new school at Harwell, England.

On the Mark

Having run through many series of "Mark" designations on everything from lumbering tanks to sleek sports cars, the British are starting on a new Mark series for their forthcoming line of atomic power plants. In anticipation of these plants, the Atomic Energy Authority has set up a Reactor School (*see cuts*) at Harwell and is currently training its first class in the techniques of converting heat from atomic piles into useful power.

The class, composed of 33 engineers and industrialists, will spend three months studying nuclear and reactor physics, metallurgy, and reactor engineering. Too, the students will actually

carry out experimental work designed to help them lay out plans for "Mark Two" power stations, which will be operated by the British Electricity Authority. They will also learn about other designs of nuclear power stations now under study.

The way Sir John Cockerill, director of the Atomic Energy Research Establishment, sees it, these large Mark Two atomic power stations "are likely to be operating in Britain in about 10 years' time—earlier if the need is great," will supply electrical power equivalent to that obtainable from 2 millions tons/year of coal.

Meanwhile, Britain is pushing ahead with work on its Mark One breeder reactors, which it hopes to have fin-



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PRODUCTION

ished and in operation within 4-5 years and from which it figures to gain experience for the operation of the larger reactors. The first breeder reactor will be housed in a steel sphere about 150 ft. in diameter at a power plant to be built at Dounreay in northern Scotland. This plant will, in all likelihood, be comparable to the first U.S. nuclear power plant abuilding at Shippingport, Pa. and slated for completion in 1957 (CW, Nov. 18, p. 42).

Help Wanted

The atmosphere was one of quiet activity at the Waldorf-Astoria last week. The last piece of luggage was set at the door of Room 971. After a month's visit, Rahim Bux Khan (see cut) was getting ready to return to Pakistan, taking with him a favorable impression of the American paint industry, new knowledge for his own paint industry. Left behind were his third son* and a better understanding of Pakistani industry.

This was Khan senior's second visit to the U.S., and, in his words, he "could not fail to be impressed." To him, the U.S. paint industry is "the most spectacularly advanced in the world"—well ahead of its counterparts in England, Germany, Australia, and Canada. Credit for this, he declared, belongs chiefly to U.S. chemical technology, which has made such a wide variety of raw materials readily available to the paint manufacturer.

The U.S. paint industry uses the

* Shamin Alam Khan plans to remain here to study our ways of making paint and paint machinery, then rejoin his two brothers in his father's paint company.



PAKISTAN'S KHAN: The U.S. is his idea of the perfect partner.

The Industries We Serve—PLASTICS



Billion Dollar Giant—At Their Service!

SO many *good* things are made of plastics today. From the time you comb your hair in the morning until you snap off your television set at night, the magic realm of plastics is at your service. There's hardly another material as strong, light, durable or as easily processed into eye-appealing forms as the products of this giant young industry, which has doubled its growth every five years since 1930.

As an integrated producer of coal-derived products, Pittsburgh Coke & Chemical provides plastics makers with many of their important "building block" chemicals—phthalic anhydride, benzene and phenol, to name just a few.

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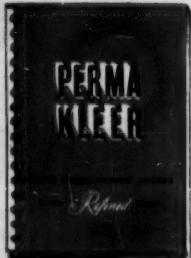
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PRODUCTION

most modern methods, has the latest machines; and, he continued, its production capacity is colossal. Did he find anything amiss about the industry? Only this: it produces too much, and as a result, many objects receive more coats of paint than they really need.

To Khan this is a waste of good paint, and he is the more acutely aware of it since demand in his native Pakistan yearly outruns supply by 4000 to 6000 tons. But as president of the All Pakistan Paint Manufacturers' Assn. and head of Buxyl Paints, Ltd., in Karachi, Khan had a more urgent message for his listeners at the Federation of Paint & Varnish Production Club's Chicago convention and at the meeting of the New York Paint & Varnish Production Club.

Pakistan needs help. As a self-governing country, it is relatively young (it was seven years old last Aug. 14), and it needs help to survive and grow. It needs basic material (for example: pigments, dyes, synthetic resins), modern equipment, outside capital, technical know-how and technically trained people. In exchange for these, Pakistan

offers certain abundant raw materials (for example: red and yellow oxides of iron; calcium, magnesium, manganese and strontium compounds; chromates and antimony; tung oil and rosin) as well as opportunities for investors who would be able to take their profits out of the country as cash.

The U.S., Khan figures, would make the ideal partner for his country in this exchange. But speed is essential, he urges, if Pakistan is to stand as a bulwark for the free world in this vital area.

Gotham Parley

More than 3500 engineers from all over the world assembled in New York last week for the 47th annual meeting of the American Institute of Chemical Engineers. The common purpose: to exchange information on subjects ranging from general business organization to highly specific technical developments.

Such free exchange of scientific and technical information, said A.I.Ch. E. President Chalmer G. Kirkbride in his welcoming address, is just one of the



Off Comes the Scaffolding

THE NEW experimental distillation unit at Fractionation Research Inc. (CW, Aug. 28, p. 44) lately shucked its construction scaffolding, played host to FRI's Technical Committee at dedication ceremo-

nies in Alhambra, Calif. The unit will serve as focal point for the co-operative fractionation research efforts of Fractionation Research's 43 subscribers in the chemical and petroleum industries.

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Let's face it...we're all targets!

If your plant is not ready with a disaster plan, better act now. There's not a single American plant that's out of range of an intercontinental bomber—and fires, floods, tornadoes or explosions can kill you just as dead as an atom bomb.

It costs next to nothing to take a few simple steps which may save hundreds of lives. Here they are. Check them off today.

Call your local Civil Defense Director. He'll help you set up a plan for your offices and plant—a plan that's safer, because it's integrated with community Civil Defense action.

Check contents and locations of first-aid kits. Be sure they're adequate and up to date. Here,

again, your CD Director can help. He'll advise you on supplies needed for injuries due to blast, radiation, etc.

Encourage personnel to attend Red Cross First-Aid Training Courses. They may save your life.

Encourage your staff and your community to have their homes prepared. Run ads in your plant paper, in local newspapers, over TV and radio, on bulletin boards. Your CD Director can show you ads that you can sponsor locally. Set the standard of preparedness in your plant city. There's no better way of building prestige and good community relations—and no greater way of helping America.

Act now...check off these four simple points...lives are at stake...have you a right to delay?



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PRODUCTION . . .

reasons why American engineering is second to none.

Since the general papers and symposia touched on achievements in almost every process used by the chemical industry, it is difficult to single out any one as the most important. But here are a few of the meeting's highlights:

- In the sixth annual institute lecture, MIT's Manson Benedict discussed the significance of cheaper nuclear reactors for research, predicted their wide application in basic studies.

- Mellon Institute's John R. Bowman, recipient of the 1954 Professional Progress Award in Chemical Engineering, sized up the role of modern electronic computers as the useful servants of, not substitutes for, the human brain.

- Aaron J. Teller of Fenn College (Cleveland, O.) explained a process that utilizes by-product hydrogen chloride as a chlorinating agent. Not only does this method permit total conversion of the chlorine, it also obviates the necessity of recovering and handling the acid.

- Pollution abatement without waste treatment, as C. Fred Gurnham of Michigan State College pointed out, offers attractive economical advantages where pollutants are recoverable for reuse, or as saleable by-products. Accomplishments of the paper, textile and metal finishing industries were cited as examples of how waste disposal can be reduced by process redesign and the development of recycling operations.

- B. D. Smith and R. R. White of the University of Michigan disclosed a process for producing a substitute for natural gas by hydrogenating carbon monoxide and carbon dioxide at high temperature and pressure over an inexpensive steel catalyst. Inspired by rising natural gas costs, the new development is technically feasible should the economic need arise.

- R. B. Thompson and Donald MacAskill of the Dorr Co. (Stamford, Conn.) led off the symposium on new processes utilizing fluid and moving beds with a description of the Fluo Solids process of recovering sulfur from low-grade ores. Next in line was the Fluid Char Adsorption process developed by Standard Oil Development Co. (Linden, N.J.) and Esso Laboratories (Baton Rouge, La.). Four Standard engineers reported the process should be competitive with the best conventional processes.

Besides these highlights, visits to industrial plants, New York's shows and scenic spots presented the engineers with a full but pleasant week.

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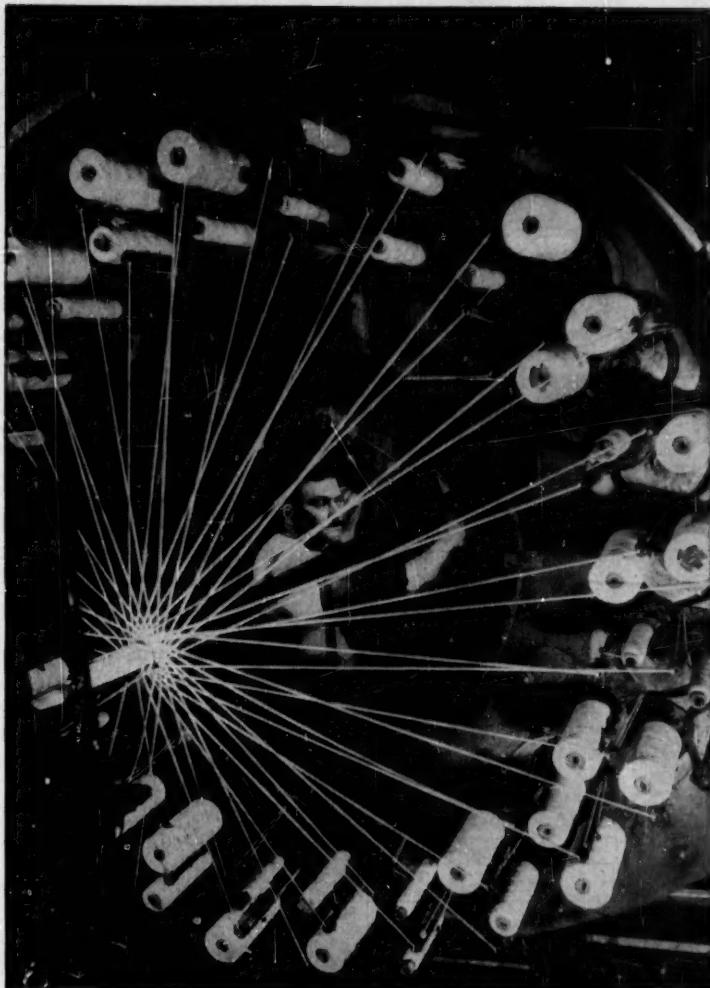
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Chloride	PR	PR	PR	TPR	PR	R	PR		TPR
Bromide	PR	PR	PR		P	P			P
Bromate		PR	PR						
Iodide	R	PR	PR		R				
Sulfide	TR	PR							
Sulfite (Bisulfite)	R (Bi)	PR	P						
Sulfate	PR	PR	PR	PR	R		R		TR
Bisulfate		R	TR						
Persulfate	PR		R						
Nitrate	TPR	PR	R	TPR	TPR	PR	TPR		TPR
Phosphate	PR	R	PR	P	R				
Carbonate	R	R	R	TPR	R	R	R		TPR
Bicarbonate	R	R	PR						
Thiocyanate	TPR	PR	TPR		P				
Acetate	PR	PR	PR	R	PR		PR		
Oxalate (Bioxalate)	PR		TPR (Bi)						
Borate	P	R	P						
Dichromate	PR		PR						
Molybdate	PR	TR							
Hydroxide	PR	PR	PR	P	PR	P	R	T	
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		SALICYLATE PR	FERROCYANIDE PR	OXIDE PR					
		DIMUTHATE R	CHROMATE PR	SILICATE P					
		STANNATE R							
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CHART

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R—Reagent Quality

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J. T. Baker Chemical Co., Executive Offices and Plant,



Baker Industrial Chemicals

TONNAGE QUANTITIES

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Chromium		R		R	R			R		R	LIGHT METAL CHROMATES:
Molybdenum										R	SODIUM & AMMONIUM MOLYBDATES: TPR
Manganese	R		PR	R		R			PR		
Iron (Ferric)	R		R	PR							HYDROXIDE: P
Iron (Ferrous)			PR								FERROUS AMMONIUM SULFATE: PR
Cobalt	PR		PR	PR		R	R		R		
Nickel	PR		R	PR		R	R		R		NICKEL AMMONIUM SULFATE: R
Copper	PR	R	R	TPR		R	R		R		
Zinc	PR	PR	PR	TR	P	R	TR	P	R		
Cadmium	PR		PR	R		R	R		R		IODIDE: R
Mercury	PR		PR	PR			PR		TPR		IODIDE: R
Aluminum	R		PR	TPR	P		R		R		HYDROXIDE: PR
Tin (Stannic)	PR										SODIUM STANNATE: R
Tin (Stannous)	TR								R		
Lead	TR		R	TPR		R	TPR	R	TPR		THIOCYANATE: P
Bismuth	R			PR					R		OXYCHLORIDE: R
Bismuth (Sub)				P	P						SUBGALLATE: P

KEY TO
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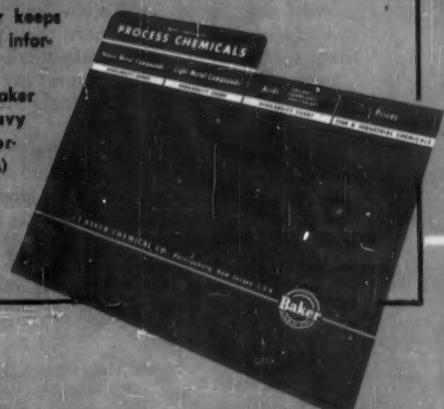
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FREE Reference File—Baker Process Chemicals

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Contains availability charts of Baker Light Metal Compounds, Heavy Metal Compounds, Acids (Inorganic, Organic, Acid Anhydrides) and complete price schedules.

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SPECIALTIES

WHAT'S WHAT IN SYSTEMICS

Tradename	Chemical Name	Maker	Uses
OMPA, Schradan, Pestox III	Bis (dimethylamino) phosphorous anhydride	Monsanto, Virginia Smelting, Dow	Cotton foliage spray, greenhouse ornamentals Major commercial systemic
Demeton, E-1059, Systox (formulation of Demeton (23%) with emulsifier, etc.)	O,O-diethyl-O,2-ethyl mercaptoethyl phosphonate	Pittsburgh Coke & Chemical (licensed from Chemagro, American agent for Bayer)	Similar to OMPA Important commercial systemic
Meta-Systox	O,O-dimethyl-O,2-ethyl mercaptoethyl phosphonate	Bayer, Chemagro	Like Systox
Diazinon	O,O-diethyl-O (2-isopropyl-4-methyl pyrimidal-6) thiophosphate	Geigy	Used in sugar bait insecticides for households; experimentally used as animal systemic; very promising
L11/6, 3911	O,O-diethyl-S-ethyl-mercaptopethyl dithiophosphate	Bayer (L11/6) American Cyanamid (3911)	Experimental results in cotton seed treatment look good
12008	O,O-diethyl-S-isopropyl mercaptopethyl dithiophosphate	American Cyanamid	Appears promising for cotton seed treatment
L13/59	O,O-dimethyl-2,2,2-trichloro-1-hydroxyethyl phosphonate	Pittsburgh Coke & Chemical; Bayer	Tested as systemic for cattle grubs; used in sugar baits for houseflies
21/199	3-chloro-4-methylumbelliferone-O,O-diethyl thiophosphate	Bayer	Some animal systemic action
Chlorthion	O-(3-chloro-4-nitrophenyl)-O,O-dimethyl thiophosphate	Bayer; Chemagro	Tested as animal systemic
Dimefox, Pestox 14	Di(dimethylamino) fluorophosphate	Pest Control Ltd.	Cocoa tree systemic use only
Isolan, G-23611	1-isopropyl-3 methyl-pyrazolyl-(5)-dimethylcarbamate	Geigy	On apple trees to halt sucking insects

Internal Avenue to Pest Control

Entomologists who journeyed to Houston, Tex., last fortnight for the second annual meeting of the Entomological Society of America had more than a passing interest in systemic insecticides—over half a dozen of the papers presented dealt with this increasingly important phase of pest control.

(As a convenient guide, *CHEMICAL WEEK* has assembled data on some of the newest systemic insecticides, and arranged it in tabular form, *see above*.)

• One of the latest products, O, O-diethyl-S-ethyl-mercaptopethyl dithiophosphate (also known by code names L11/6 and 3911, CW, Nov. 20, p. 106)

was reported to give four- to nine-week protection against boll weevil, cotton leaf perforators, spider mites, and cotton aphids when applied to seed as a carbon-impregnated dust.

• Novel way to screen systemic insecticides was demonstrated; it makes use of water-breathing crustaceans (*Daphnia*).

• Further work on use of systemics subcutaneously and orally to combat cattle parasites, and the accompanying toxicological problems—e.g., residues in tissue and milk, and effects on growth and reproduction—was covered. This is the eighth year of work

on systemics applied to animals.

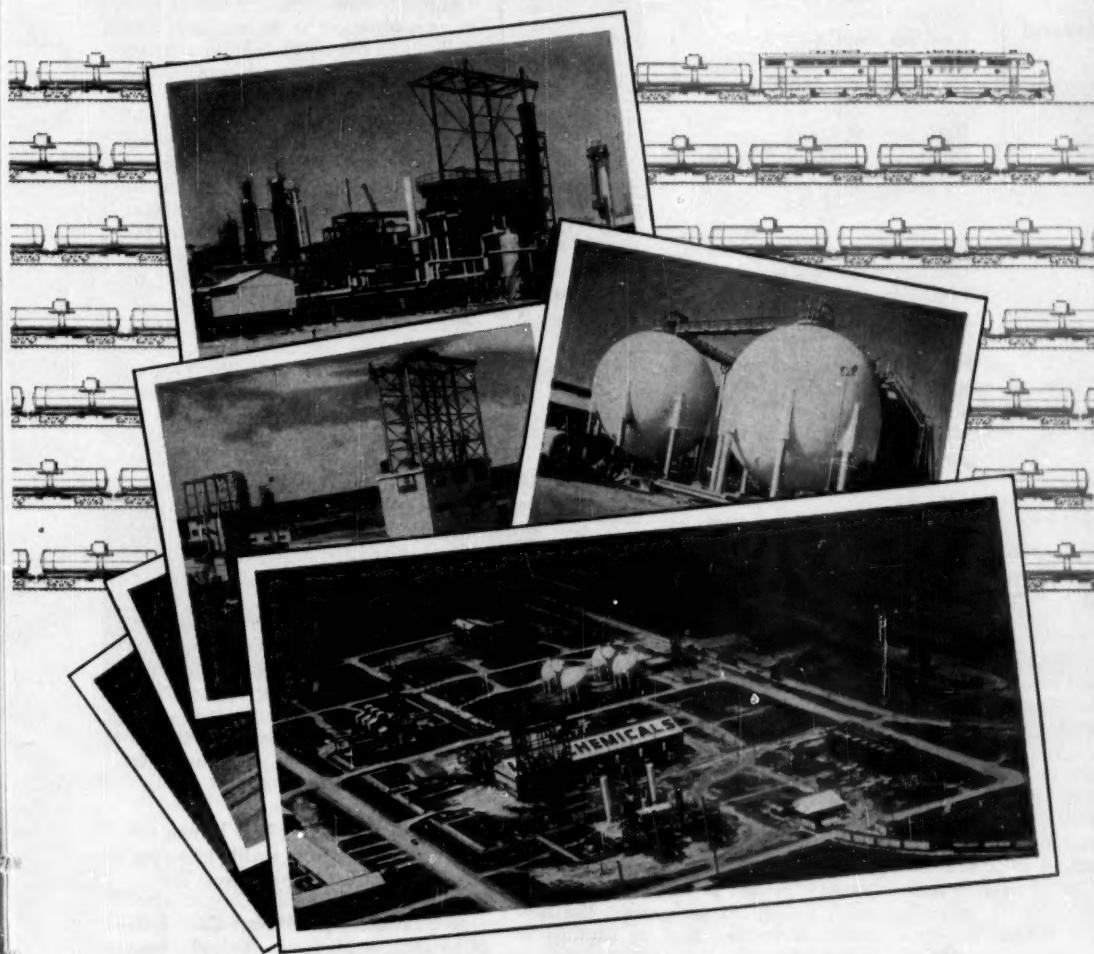
• Systox and OMPA, the two most important systemics sold commercially in this country now, are still being studied for their effects on plant functions.

Systemics were not, of course, the whole show. New insecticides and insect repellents, and their applications, were also discussed. One major area of concentration: control of the pink cotton bollworm.

The complete papers will be published by the Entomological Society of America (president, Herbert H. Ross, University of Illinois, Champaign, Ill.).

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Ammonia plants placed "on-stream" in 1954 for Phillips Chemical Company, Lion Oil Company, American Cyanamid Company, and Sherritt Gordon Mines, Ltd. add more than 1,000 tons daily ammonia production to the already impressive total capacity of Chemico-designed plants.

Chemico provides a *complete* project service in designing the plant, supplying all material, and erecting structures and equipment to produce ammonia from natural gas, by-product hydrogen, or other suitable raw materials.

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HOW FACTORING HELPS A FIRM

Plant Background	Plant with equipment is worth \$100,000. Furniture, equipment worth \$4600. Equity in kettles, etc., worth \$40,000, being bought on time. Trucks worth \$2200. Total: \$146,800	
	Cash on hand, \$4480. Accounts receivable \$56,000. Raw materials \$4200.	\$64,680 quick assets
Problems	Bank loan, \$24,000. Due trade creditors, \$36,000. Taxes, accruals, \$6400.	\$66,400 current liabilities
	Bank seeks to reduce loan. Two new salesmen needed. Taxes, accruals should be brought to date.	
Solution	Factor buys accounts receivable, advances \$50,000. Bank loan reduced. Salesmen are added for new business.	

Money to Grow On

According to many economic forecasts, the coming year should be one of growth for the chemical industry. Specialties makers are, for the most part, sharing in this optimism, foreseeing opportunity for plant expansion and the launching of new projects.

An obvious and vital requisite for such enlargement, however, is money, and for many firms turning out specialized chemical products, securing that money will be a difficult task. To illustrate: some time ago (*CW, July 17, p. 54*), **CHEMICAL WEEK** surveyed specialties makers, and discovered that one-fifth of the firms planning expansion had trouble raising money. Only 7% of firms surveyed, however, had tried a form of commercial financing called factoring.

In recent years, this form of lending, which is most generally associated with the textile industry, has branched into a number of other enterprises. Nowadays, everything from auto parts manufacture to wine bottling is factored. In the chemical specialties field, aerosol loaders, cosmetic firms, drug makers and paint manufacturers have been so financed. Perhaps fac-

toring can solve some of your problems.

Plan Pair: Factoring (a broader term is commercial financing) generally proceeds along two lines:

- Old line factoring, where the borrower sells his accounts (his orders from customers) outright to the factor. The factor investigates the financial status of the borrower's customers, collects these bills, assumes the loss should a customer default. Cash is made available to the borrower as it ships goods. In such cases, the customer is notified that its supplier is being factored.

- Accounts receivable financing, where the loan is also made on the basis of sales—generally, 90% of the value of the sales is made available as the goods are shipped. The customers are not notified in this case, borrower does credit work, assumes losses.

Naturally, this ready supplying of cash is not made without charge—rates average 10-12% per annum. Although this is much higher than rates charged by banks, the figure can be somewhat misleading. Cash is not borrowed in a lump sum, but only as it is needed to keep the business function-

ing, and for as short a time as possible. Accounts receivable are the only security the factor has—it has no claim in the firm or its plant.

In many cases, the available cash from the factor permits the borrower to buy supplies cheaply, and to pay bills promptly at discount—the loan costs are sometimes less than would be paid on a bank loan at 4½%.

Flexibility: Although these two systems are the main ones by which a factor advances money, much of their success in recent years has been their willingness to vary their lending procedures, and advance cash where other sources would be unable to.

Factors can lend for importing and exporting, for expansion—even for advertising programs. Their ability to analyze companies, and to advise them, determines the circumstances under which they will make loans.

One well-known example of a drug specialty firm that has expanded by means of factoring is Vitamin Corp. of America (maker of Rybutol), which was recently purchased by Rexall. When it started in 1941, it borrowed on "accounts receivable," with a maximum of \$10,000. Its growth was so fast, and its need for money so great that banks would not provide it. VCA stayed with its factor (A. J. Armstrong, Inc.) and by '52, had a limit of \$1.2 million. It established such a good record that Armstrong advanced it \$60,000 for an ad campaign, with no security.

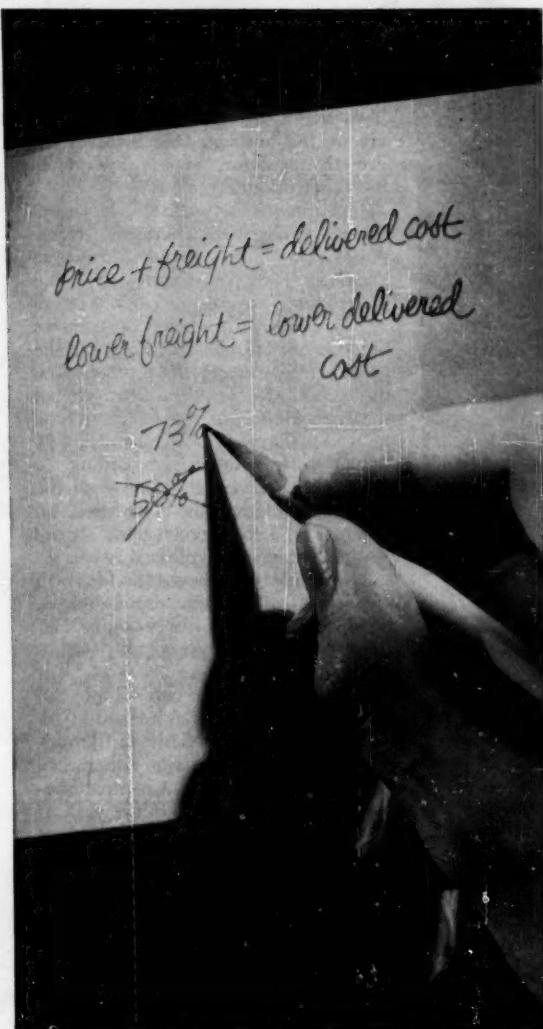
Urban Concentrate: Because they were spawned in the heavy trade areas of the textile industry, most factoring firms are in the large cities, New York, Chicago, San Francisco. But many have accredited representatives throughout the nation, and are eager to factor firms in any part of the country.

Some of the factors best known for their work apart from textile factoring are A. J. Armstrong, Inc. (New York), Commercial Discount Corp. (Chicago), Walter E. Heller Co., Inc. (Chicago), and James Talcott, Inc. (New York). There are, of course, numerous other factors, and some banks offer accounts receivable financing.

In many cases, factors are in a position to act very quickly on loans—a day or two after consulting the factor, cash is made available.

Commercial financing firms are eager to explain and discuss their facilities with any fast-growing company. Factoring—and related plans—isn't offered as an end-all means of financing, but it is a system that many specialties firms could do well to investigate.

DOW



THE ECONOMIES OF 73% CAUSTIC SODA SOLUTION are no longer reserved for the largest users . . . lower shipping costs now make it the best form for you, too.

How long has it been since you have checked your caustic buying habits in the light of increasing cost factors? Higher freight rates are erasing the savings in 50% caustic solution for more and more users every day. Even users located near shipping points save money with 73%, since the higher price of even shorter distance hauls quickly wipes out the price difference between 73% and 50%.

73% caustic must be diluted when received, but most caustic users dilute 50% solution, too. The cost of additional handling equipment for dilution, when fairly amortized, becomes a small item in comparison to your over-all cost reduction.

73% CAUSTIC SODA . . .

a little figuring
may prove it
your best buy!



FAST, DEPENDABLE DELIVERY of uniform 73% caustic solution is assured through use of Dow-owned tank cars. These 8,000- and 10,000-gallon cars are insulated, protectively lined, and fitted with nickel heating coils; unload from top or bottom by air pressure or pump. Frangible discs, protective plug cocks are two of the advanced safety features.

If you are still buying 50% caustic solution, discussion in your plant and consultation with our Alkali Technical Service is indicated. Perhaps the comprehensive Dow Caustic Soda Handbook can help you in preliminary discussion. Ask your Dow sales representative for your free copy or write to THE DOW CHEMICAL COMPANY, Dept. AL 901B-2, Midland, Michigan.

you can depend on DOW CHEMICALS

DOW

SPECIALTIES



HOLCOMB'S CAMPAIGNERS:^{*} A word to executives on housekeeping in the plant.

Top-Level Approach

Nearing the end now is the third successful year of a novel idea in selling industrial maintenance supplies.

The idea: not only sell the operating personnel on the value of your products, but also keep reminding plant executives about your company.

The method: a regular promotion campaign in a consumer newsweekly.

The originators: J. I. Holcomb Mfg. Co. (Indianapolis).

The results: "Exceptionally good."

It isn't that Holcomb, a firm that has been in the maintenance specialties business for 59 years, owes all its success to its unusual advertising plan. It has national distribution of its products and services, and claims to be the largest firm making both specialty cleaning chemicals and cleaning brushes. (It has some 300 salesmen.)

Holcomb simply felt that a fresh approach in advertising—consumer advertising by firms of Holcomb's nature are rare, indeed—might give its salesmen a boost.

Here's how the management (*see cut*) arrived at its program: it had learned that its salesmen called on two basic groups of buyers—the executives (business owners, partners, etc.) and the operating men (department heads and maintenance men). It believed that its ad program† adequately covered the operative group, but left out the executives. To reach them, with a limited budget, Holcomb decided to try *Time* magazine, with two-third-page ads to appear about monthly (in

'53, *Newsweek* was alternated with *Time*).

These two newsweeklies were the only magazines in the consumer field that Holcomb felt it could afford to advertise in. After one year in both, it decided to concentrate on *Time* magazine alone.

Easy to Look At: It was the view at Holcomb that *Time* had circulation in the group Holcomb wanted to reach, that it had a certain prestige value. Further, it was easy to get extra copies of the magazine (sometimes that's a problem with trade publications) so that salesmen could show them to prospective customers.

Holcomb is well set up to benefit from its promotional plan. Besides home offices centrally located in Indianapolis—factory, warehouse, research laboratories—it has another factory in Los Angeles, and warehouses in Los Angeles and New York.

It makes quite a line of maintenance products, nearly 500 items. Included are such basic items as floor brushes, sweepers, floor waxes, floor seals, liquid synthetic detergents, powder cleaners, abrasive cleaners, insecticides, deodorants, wood and metal polishes—the whole list of chemicals and equipment for institutional use.

All these products are distributed through its own sales force, and are sold direct to the ultimate user. There's no contract or private label work done.

So far, though other firms can match many of its products, none has tried to match its uncommon sales program. Holcomb, however, believes it has found two paths to the buyer's door, and plans to continue, perhaps expand, its program in '55.

* Left to right: M. O. Speakman, vice-president; E. E. Martin, president; R. C. Sweeney, account executive (Keeling & Co.); J. I. Coffin, director of sales and research; R. S. Smith, advertising manager.

† In such magazines as *Modern Sanitation*, *Nation's Schools*, *Institutions*.

Treating Tubers

Two new ways to preserve potatoes are on the horizon. One involves the growth regulator, maleic hydrazide; the other, atomic radiation.

Pushing maleic hydrazide is the patent owner, Naugatuck Chemical. It reports that potato-growing farmers in Maine's Aroostook County this fall started spraying plants two weeks before harvest with a powder form of the compound, MH-40. Entering the potatoes by means of translocation, the product is expected to prevent their sprouting—and rotting—from nine months to one year (CW, Sept. 12, '53).

Not Just Potatoes: According to Naugatuck, this is the first year the growth regulator has been used on potatoes on a commercial basis. If the Maine farmers are pleased with results, Naugatuck believes the idea will spread to other root crops—onions, turnips and carrots, for instance. At present, USDA permits use on potatoes and onions only.

The second method comes from the University of Michigan. Headed by Lloyd Brownell, supervisor of the university's Fission Products Laboratory (who is working under a contract between the university and the AEC), engineers there have designed an atomic radiation plant that would treat 250 bu. of potatoes an hour at an estimated cost of 6¢/bu. Once irradiated (the dosage serves to destroy those cells that cause growth), the potatoes may be stored at 50 F for a year or more without sprouting (untreated potatoes will generally sprout within six months).

Brownell estimates that the plant could be built for around \$50,000 and could be operated for about \$40,000/year. Using cooling fuel elements or radioactive by-products from a nuclear reactor as a source of radiation, it would be operated for six or eight months each year by processors or cooperative farm groups.

Widespread Benefits: The argument for such potato treatments is that it would permit farmers to grow more potatoes and to sell them throughout the year. Also, firms preparing potato chips, canned or dehydrated potatoes could use local potatoes during the full year, without relying on more expensive shipments from other parts of the nation between seasons.

The job can be done by both these processes. Whether such treatment means a broad new outlet for the versatile maleic hydrazide, or puts the atomic energy industry into agriculture probably won't be decided immediately. But the farmer and consumer stand to gain in either case.



from a cold start

to fully effective heat input in minutes—

that's the story of the ...

Blaw-Knox radiant furnace

The Blaw-Knox Radiant Furnace for batch operation has such low heat capacity that it can be brought to fully effective operation in five minutes or less. Cut the fuel supply and it is black in one to two minutes.

The nearly instantaneous response to direct instrument regulation of the fuel input permits close temperature control of a batch of oil or resin, even in an exothermic stage.

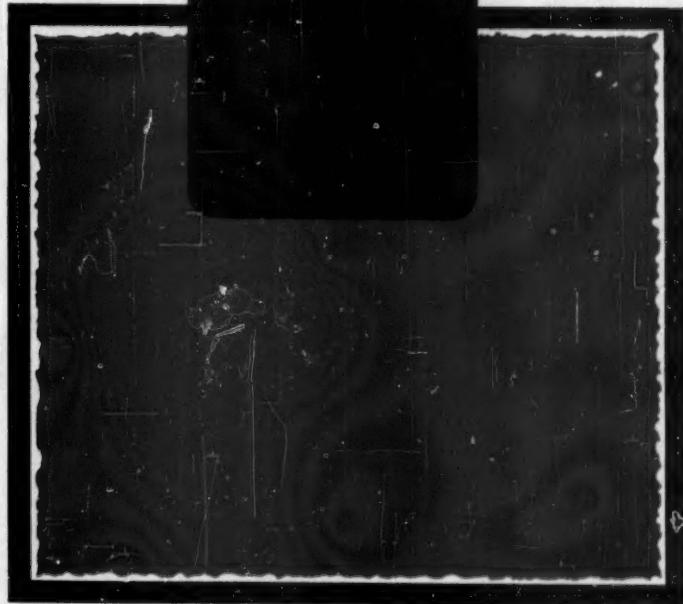
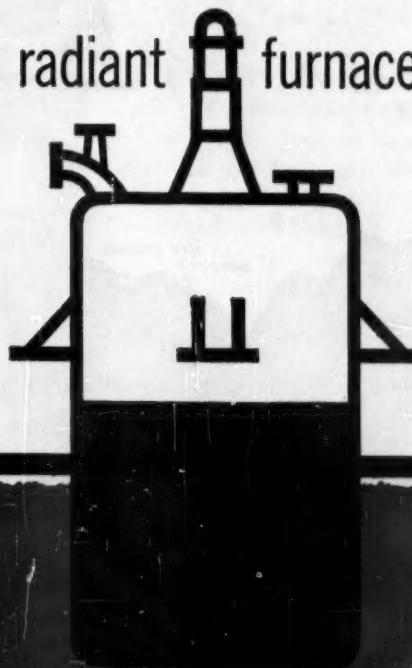
Successive cooking curves on different days are smooth and identical.

The basic design of the Blaw-Knox Radiant Furnace is a light stainless steel shell surrounded by high temperature, light weight insulating material.

Approximately 75 percent of the heat to the batch is supplied by radiation from furnace walls arranged to eliminate local hot spots.

Field reports of normal plant operation indicate fuel savings close to 50 percent over conventional, brick-lined, direct-fired furnaces.

Write for complete information on the application of this low heat capacity furnace to direct-fired processes.



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SPECIALTIES . . .

Indefinitely Stable: A light-colored sodium lauryl sulfate for use in shampoos, which is said to be indefinitely stable under neutral or alkaline conditions, is now offered by Raymond Laboratories, Inc. (St. Paul). The item, Pendit WA Cosmetic, is also offered as an emulsifying agent for such products as dishwashing compositions and car washes.

Lessens After-Odor: A new textile finish, claimed to greatly reduce formaldehyde after-odor, has been developed by Jersey State Chemical Co. (Haledon, N.J.). Name: R-300. No special application is required.

West Coast Trek: A San Francisco plant has been opened by Transparent Package Co. (Chicago), maker of cellulose and plastic film casings for meats and other foods. The company, known as Tee-Pak, says this is the first plant of its type on the West Coast.

Fabric Conditioner: El Roco Products Co. (Chicago) has begun selling a fabric conditioner Sof-Touch, that's said to kill static, keep clothes freer of wrinkles, make them iron faster, easier. Application is in final rinse water. Price: \$1/qt.

Cleaner With Lanolin: Rug Sheen Inc. (Lubbock, Tex.) has developed a product for rugs that's claimed to remove grease, oils, food and beverage stains, ink, gum and lipstick. Name: Rug Sheen. It's sold in powder form for wool rugs at \$3.89/gal.

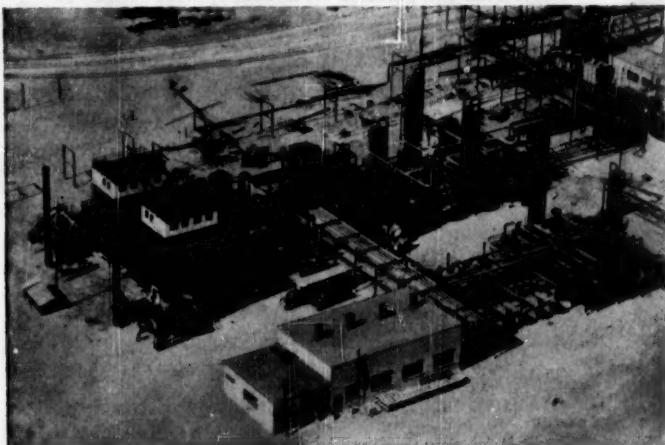
Barrier Coat System: Socony Paint Products Co. (Metuchen, N.J.) reports it has successfully compounded a new-type barrier coat system for steel ship hulls. Called Aluminum Barrier Coat, the product is said to make it impossible for corrosion to take place. Socony says the system will also be used eventually for feed-water and condensate tanks. In industrial uses where the barrier coating system may be attacked by alkalies or acid, Socony has developed a protective black top coat.

Special Salt: A mineral rock salt product said to be more effective than other types now sold is being pushed by International Salt Co., Inc. (Scranton, Pa.). Dubbed Halite Crystals, the product is claimed to melt 46 times its own weight in ice and snow at 30 F.

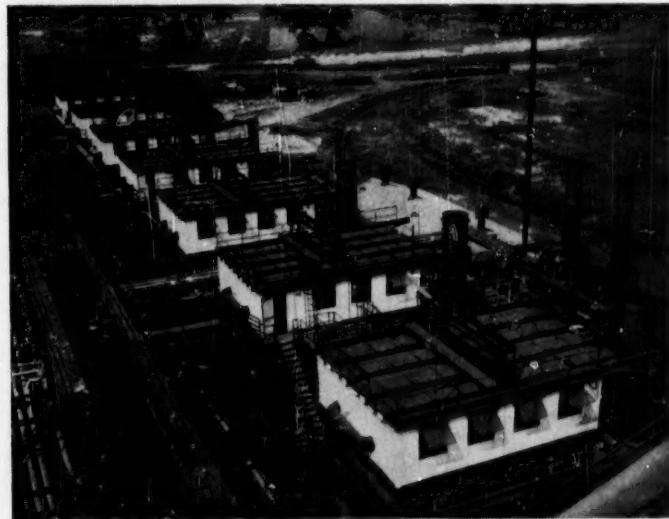
Newark Lab: Du Pont has opened a new laboratory for research on pigment colors at its Newark, N.J., plant.



AT HOPEWELL, VA.



AT OMAHA, NEB.



AT SOUTH POINT, OHIO

SYNTHESIS GAS

Three GIRDLER plants set output record for NITROGEN DIVISION

Allied Chemical & Dye Corporation

WITH the three plants shown, Nitrogen Division, Allied Chemical & Dye Corporation, produces more synthesis gas for ammonia than any other company. Girdler designed and built these gas reforming plants at South Point, Ohio; Omaha, Neb.; and Hopewell, Va., and is now installing additional gas reforming facilities in connection with Nitrogen Division's latest ammonia expansion at Hopewell.

These plants, using natural gas as the process material, have given Nitrogen Division these benefits: lower gas production cost, lower purifying cost, simplified control of gas composition, and a saving in ground area.

Find out how Girdler can serve you in process design, engineering and construction. Call the nearest Girdler office today.

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GIRDLER MANUFACTURES processing apparatus

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Hydrogen Production Plants	Acetylene Plants
Hydrogen Cyanide Plants	Ammonia Plants
Synthesis Gas Plants	Ammonium Nitrate Plants
Carbon Dioxide Plants	Hydrogen Chloride Plants
Gas Purification Plants	Catalysts and Activated
Plastics Materials Plants	Carbon
	Fertilizer Plants

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Glycerine

helps maintain
the Flavor



For almost 70 years, confectioners, bakers and soda fountains have used flavoring extracts made by W. Sheinker & Son. For all these years, W. Sheinker & Son has found that U.S.P. Glycerine is an excellent solvent for the company's flavoring extracts.

Nothing takes the place of
Glycerine

Glycerine can perform an unusually wide range of functions for food processors. Take flavoring products for example. Glycerine is often the principal solvent; the compatibility of its own pleasant taste with other flavors is a valuable asset; and its viscosity adds body.

In candy making, Glycerine lends smoothness and increases softness and palatability. In the manufacture of meat casings, Glycerine acts as a plasticizer—promoting flexibility by retaining moisture.

In the processing of ice creams, wines and beers, dried fruits and nuts, bakery goods and many other food products, U.S.P. Glycerine is chosen for its ability to act as a humectant, sweetener or solvent. In all these capacities, Glycerine helps to maintain food flavor and quality right through to the ultimate consumer. And, what is very important, U.S.P. Glycerine's freedom from toxicity makes it safe for use in food products.

TECHNICAL
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12-page booklet on Glycerine standards and specifications

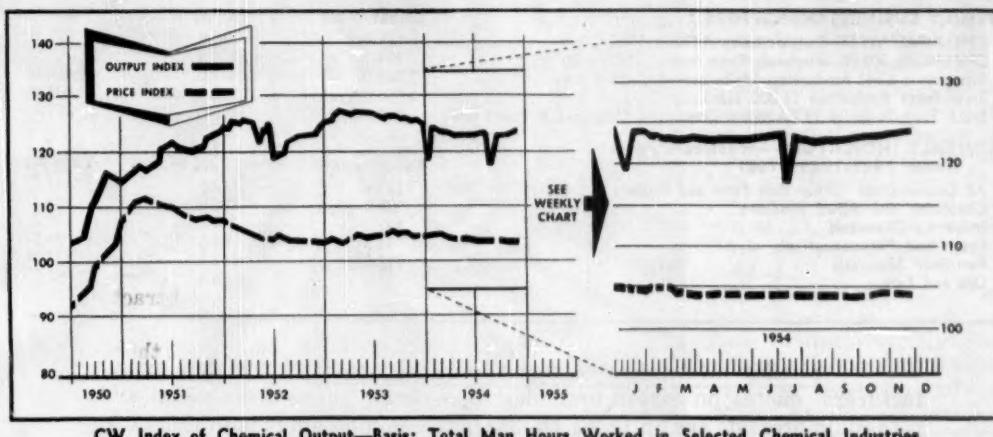


16-page booklet on Glycerine properties and applications



For your free copy of any or all of these booklets, write Glycerine Producers' Association, 295 Madison Avenue, New York 17, N. Y.

MARKETS



MARKET LETTER

Approach of the holidays is apparently having little effect on chemical price activity. Crazy-quilt pattern of trends—some tags up, others skidding—continues unabated.

One on the hike side, for example, is industrial refined naphthalene. Though all makers haven't yet posted the change, some customers are already paying a full 1¢/lb. more than they have been. Tank-car tags in the industry will likely fix at the higher 10½¢/lb. mark, and c.l. at the new 11½¢.

And imported 78° naphthalene prices are still notching upward (*CW Market Letter, Dec. 11*), have buyers warily watching and waiting for a mirrored move in domestic crude material. Most are stepping up purchases at the 5¢/lb. price, but there's a fair possibility an advance may greet customers soon—perhaps within a week or so. Until now the current price has been exceptionally firm in the face of uptrending imports.

Stronger, too, is the present phthalic anhydride market. General interest in phthalic has picked up noticeably since the first of the month, so much so that a few observers are actually calling it a "surge in buying." Part of the attention is attributed to greater calls from alkyd resins and paints, as well as to the better tone in phthalate plasticizers.

Speculation on higher crude naphthalene prices extends into the phthalic trade: a boost in the former could have a follow-through effect on the latter. At least one major phthalic anhydride seller, though, expects no "immediate" change.

Following similar earlier moves by several other producers, General Electric last week increased its general-purpose polyester resin prices by 1¢/lb. The action fulfills the indication (*CW Market Letter, Oct. 23*) that Reichhold Chemicals advance then would likely set the industry standard at 35¢/lb. That's GE's 40 drum quantity tag, with slightly higher quotes for smaller lots.

Reason behind the raise has more to do with basic economics than with competitive measures—all polyester makers have felt the same cost-swelling pinches (raw material, freight, labor).

MARKET LETTER

WEEKLY BUSINESS INDICATORS

	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947=100)	125.5	125.0	124.6
CHEMICAL WEEK Wholesale Price Index (1947=100)	104.3	104.3	105.0
Bituminous Coal Production (daily average, 1,000 tons)	1,463.0	1,417.0	1,434.0
Steel Ingot Production (1,000 tons)	1,756.0 (est.)	1,950.0 (act.)	1,444.0
Stock Price Index of 13 Chemical Companies (Standard & Poor's Corp.)	366.5	375.0	269.1

MONTHLY INDICATORS—Wholesale Prices (Index 1947-1949=100)

	Latest Month	Preceding Month	Year Ago
All Commodities (Other than Farm and Foods)	114.6	114.5	114.5
Chemicals and Allied Products	107.0	106.9	107.2
Industrial Chemicals	117.6	117.6	119.2
Drugs and Pharmaceuticals	93.6	93.6	93.5
Fertilizer Materials	112.2	112.1	112.9
Oils and Fats	57.8	56.5	58.0

Similar mounting cost factors are responsible for higher manufacturers' quotes on major bromides. Less-carlot prices for sodium and potassium bromide are up 1¢/lb. (to 35¢); the ammonium is now 39¢, 1.c.1.

Advanced, too, are bromine schedules. A major producer late last week set tank-car tags at 21½¢/lb.—the first alteration in over a year. The increases are effective immediately on spot orders, Jan. 1 for contract customers.

Largest bromine outlet, of course, is ethylene dibromide, but thus far there are no indications that the gasoline additive will tread the same price incline.

Fulfilled is the prediction (*CW Market Letter*, Nov. 13), that synthetic camphor tablet users would soon be paying more. Powdered synthetic camphor was increased then by major producer Du Pont. This week sole U. S. tablet maker Chas. L. Huisking posted nickel-higher synthetic tablet schedules.

The new prices per pound, which wipe out last March's drops: ounce and half-ounce tablets, 2000-lb. lots, 90¢; 1000-lb. lots, 91¢; 100 lbs., 92¢.

On the other hand, chlorine prices are expected to remain fairly well pegged at current levels. For the most part, makers have geared production to demand, forestalling too great an oversupply of the material. Calls for chlorinated insecticide manufacture are seasonally off, but trade watchers envision a pepping up of chlorine movement to this outlet in the next few weeks. Reason: preparations getting under way for spring requirements.

Another bright spot in the pesticides market is word that General Services Administration has called for bids on a near-17.5 million lbs. of 75% DDT wettable powder. Bid-opening for most of it takes place this week.

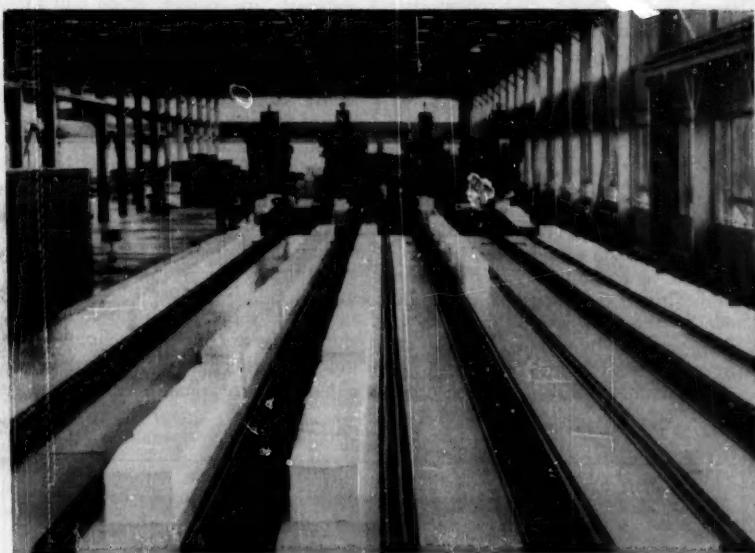
Welcome string to GSA's requirements: the material must come from the U. S. or possessions. Bulk of the DDT is destined for India, but some will head for Iran, Indochina, Pakistan and the Philippines.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending December 20, 1954

UP

	Change	New Price		Change	New Price
Bromides			Bromine, purif., t.c.	\$.02	\$.215
Sodium, USP, bbls., kgs., works	\$.01	\$.35	Naphthalene, ref., indust., dom., chipped or crushed, t.c.	.01	.1075
Potassium, USP, gran., bbls., kgs.	.01	.35			
Ammonium, NF, gran., bbls.	.01	.39			

All prices per pound unless quantity is stated.



PULP FOR INDUSTRY: Prime outlet for salt cake.

Stint in Salt Cake?

These days, a commodity even hinted to be in tight supply is a rarity in the nation's chemical marketplace. Thus, the supply/demand picture on one item, crude salt cake (technical sodium sulfate), is—and has been—under close scrutiny by more than one vitally concerned trade follower.

Completed just last week, for example, is a comprehensive survey calculated to pinpoint actual consumption of salt cake in its biggest outlet, sulfate pulp production. At least 80% of the total sulfate sold winds up in that use.

The probe, conducted by the American Paper and Pulp Assn., seeks to accurately peg annual salt cake use since 1949, as well as to arrive at a fair estimate of consumption for the current and upcoming years through 1965. That interest in the product runs high in the trade is emphasized by this fact: an unprecedented 98% (63 out of 64) of the kraft pulp makers responded to the questionnaire.

Findings haven't yet been evaluated, and probably will not be made known for several weeks. When the results are ready, distribution will probably be limited to kraft mills contributing to the survey. The government, though, is slated to receive a copy of the tabulation—which also includes sulfate pulp production figures for the years mentioned above and use figures on other chemicals replacing salt cake. The information will then likely be collated with production and capacity data being gathered for an

industrywide report now in preparation by the Business & Defense Services Administration.

Short Shift: For the past several months, consumers have been consciously noting that salt cake was undergoing another erratic dip in its long-range production curve. Actually, supply and demand of the material is seldom long in balance. Reason, of course, is that much of the technical-grade sulfate (in addition to that produced from mining natural mineral deposits) arises as a by-product of a multitude of chemical reactions.

Most important of these chemical sources: hydrochloric acid manufacture, via the Mannheim process (salt plus sulfuric acid yields hydrochloric plus the cake); production of viscose rayon; sodium bichromate. Smaller amounts are recovered from production of hydrochloric by the Hargreaves process, phenol (from sulfonated benzene), lithium salts, and borates.

Output of salt cake—by far the largest sodium sulfate tonnage classification*—continues on a generally upward trend. Note these figures for the last six years:

Salt Cake Production (short tons)

1949	537,800
1950	561,400
1951	707,900
1952	662,400
1953	734,000

*Other forms: Glauber's salt; anhydrous refined.

Despite '53's record turnout, salt cake demands, especially from booming kraft paper makers and detergent producers, have been expanding faster than the chemical. And adding to consumers' problems is the fact that the sulfate's monthly production rate is in a skid. At '54's three-quarter mark, the tally was 486,771 tons—a 58,000-ton lag behind output for the similar period of '53. Some observers fear this year's windup will barely touch 640,000 tons.

(A parallel situation—in some respects—existed as recently as 1951. Early in that year, hectic calls for sodium sulfate created a tight supply condition. However, production was stepped up, demand leveled, and by the end of the year suppliers again were satisfying customers.)

Puzzling now, though, and enough to warrant analyses such as APPA's, is the width of the chance that salt cake will soon be ample to meet continually growing needs. Crux of the poser has been the slipping in hydrochloric acid, sodium bichromate, and rayon production—all contributing substantially to lessening salt cake.

Take the sulfuric-salt hydrochloric, for instance. Last year, production topped even that of the full-steam-headed '51—180,000 tons vs 175,000. But HCl stocks have become so plentiful—perhaps spurred by the sulfate requirements—that producers are apparently braking turnout. Latest available data indicate that '54's total may just about hit the 150,000-ton mark—less than the pre-Korea 165,000 level.

The slowing down points up a handwringing switch in importance. Heretofore salt cake has been tabbed as the by-product in hydrochloric manufacture, but some producers today virtually consider it the main product.

Rayon Run: Running almost neck and neck with natural last year as a source of sodium sulfate, rayon accounted for 251,144 tons (100% Na_2SO_4); mineral deposits yielded 252,555 tons. But the '54 story, through September, of salt cake from rayon, reads like a carbon copy of the hydrochloric situation—drastic dropping. The ending, however, may be happier.

In the latter part of last year, regular-tenacity viscose rayon yarn (for straight rayon fabrics), slipped into the general textile slump, while the high-tenacity material during this year suffered a double impact: a strike and high inventories in the tire industry; increased competition from nylon cord.

Tossing in the high-tenacity, plus staple and tow figures, brings out the gloomy nine months' overtones in

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- Ammonium Laurylsulfonate
- Ammonium Valerate
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- β -Amylase
- Androstanedione
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M A R K E T S

rayon as a whole. The comparison stacks up like this:

Total Rayon Production
(million lbs.)

Quarter	1953	1954
1st	211	199
2nd	240	199
3rd	223	199

During the October-December stretch last year, rayon production slithered to 203 million lbs., checking out the year with an 877-million-lbs. total. Should the current quarter also level at the near-200-million rate, sodium sulfate by-product would approximate '52's 232,000 tons.

But that isn't likely. And if trade

optimists are correct, rayon will show a surprising comeback for the last three months. A few market followers expect this year's rayon production to come close to—perhaps exceed—the 1953 quantity. Thus, if the upward rayon trek continues into '55, hard-pressed sulfate users can look for a smoother path; it could mean sulfate from rayon will inch above the 250,000-ton/year tempo.

Add, But Less: Usually fourth among sulfate supply sources, manufacture of sodium bichromate has also since midyear been on a definite down-grade. (Earlier months, however, indicated a slight pickup from the last



Seasonal Outlet

IT'S A ONE-SHOT MARKET, but 27 internally illuminated plastic snowmen now brightening Los Angeles' Miracle Mile (Wilshire Blvd. shopping center) typify reinforced polyester resins' multitudinous uses. The snowmen, made by a new fiberglass molding process with integral pigmentation, are about 13 ft. high, weigh 130 lbs. each (of which 110

lbs. is resin) and have a surface area of 44,820 sq. in.

The manufacturer (Econ Fiberglass), is mum about its laminating method, which eliminates cloth or structural reinforcement, but claims the process will have "wide applications."

The resin is American Cyanamid's Laminac.

months of '53.) Total for last year rounded out to 109,000 tons, producing some 100,900 tons of the sulfate.

Despite the switch from leading to lagging comparable months in '53, this year's total may hit only slightly less. Output of salt cake may fall somewhere between 1952's 80,685 tons and '53's figure. Indications, too, are that demand for chromates is at a brisker pace compared with summer calls.

Import Stretch: Probably the most accurate barometer of domestic salt cake availability is the quantity strapped consumers take from outside-U.S. producers, principally Canadian. At one time, users here leaned heavily on such imports. For instance, some 15-20 years ago, amounts shipped in equaled as much as 80% of U.S. production. In recent years—except for the brief surge induced by the Korean War—imports have fallen off. Last year's 53,400 tons came to 7% of domestic production.

By now, though, the situation has a reversed-negative aspect. Foreign-tagged salt cake consumed in the U.S., only through August of this year, nearly matches '53's total amount. And, if when statistics are available, the trend proves to have held, this year's total could be near 100,000 tons.

There are many who question whether a true shortage of salt cake exists. With domestic natural producers hustling to fill the gap left by by-product makers, with imports flowing strongly, with reports circulating in the trade of new untapped beds of natural sulfate, it would appear that salt cake, *per se*, is ample enough.

Actually, consumers can get all the sulfate they need, but it's a case of stretching for supplies—and paying the freight. The scarcity lies in "nearby available" material. Some users are reportedly shelling out as much as \$18-19/ton, for freight, while most normally expect to keep charges under \$10.

The dearth of such stone's-throw sulfate has pressured prices, too. Currently the reigning quote in many areas is \$26/ton. (Compare that with the \$12.50/ton sellers were getting in some sections of the country just a few years ago.) But consensus in the trade is that further price increases are in store. Reason: expansions in existing pulp and paper mills, plus new mills scheduled for onstreaming soon, will continue to prod demand ahead of supply—at least for a while.

In the foreseeable future, however, salt cake circumstances will again alter, as they have in the past; perhaps by '55's end, the millennium—a balanced market—may be a reality.



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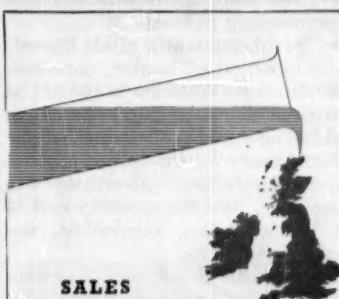
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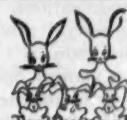
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DISTRIBUTION . . .



SALES CHAIN: Rose and Pollock are forging links for Brown-Allen with an augmented network of distributing outlets, new product

New Tool-up for Operation Bootstrap

In just a few weeks, Brown-Allen Chemicals Inc. (Staten Island, N.Y.) will finish minor modifications, take the wraps off a long-sought product. It has, it claims, the industry's first high-gloss moisture-set varnish. Special significance for the firm attaches to this development. Its the first concrete result in one phase (new products) of B-A's plan to right a depressed sales situation.

The situation facing John Fowler, president, his executive assistant, John Reid, and Alvin Rose, sales manager, when they assumed duties at B-A last spring could hardly be described as encouraging. Successor to the old Brown Oil & Chemical Co., B-A was having a rough time. Sales of paint vehicles (linseed, soybean, other oils) had slipped steadily; volume (all products) was now at \$4.8 million (1953) as compared with a postwar high (1946-47) of \$26.27 million and a 1952 figure of \$8.4 million.

Rose's work was cut for him when he came in (from Cargill-Fisk) as the last step of new management reorganization.* While external factors (federal linseed embargoes and ending of

*In 1952, Brown Oil merged with Chasers, Inc., a candy oil concern. The company took its present name and acquired several photochemical interests (Standard Piezo, Solid State Research Institute) and the Brown family gradually stepped out. In 1953, Vat-Craft was added; and last October, the Allied Mfg. Corp. (TV yokes, coils, transformers) was picked up. Currently, chemical and oil sales account for about 25% of the business, Rose estimates.

war contracts) had largely caused the last sales drop, there was still this ulcerprovoking picture:

- Speculation on the crude linseed-soybean-natural oil market, once successful, met its Waterloo in 1951. The distributor chain had gaps in coverage, could stand a shuffle. Customer service and customer relations needed improving. Relatively little advertising was being done. And the specialty end of the business, long overlooked, demanded revitalizing.

Clearly, the entire sales approach needed complete overhauling. First step, explained Rose and Vice-President Pollack, was to switch the field of emphasis. Brown-Allen, which had been basically a crude oil processor, would now become a specialty producer. This would move the firm away from the uncertainties of the oils market, permit upgrading, and tap the profitable stream of new synthetics.

The Staten Island company has no intention of departing the natural vehicle business and will continue to push vigorously its various oils. But in the future, the drive will be hard and straight to specialties for the paint, printing ink, foundry, and floor covering industries.

To effect its new specialty policy, and rebuild sales, the company is working hard at new products, product diversification, customer service, and expanding its distributor chain

with active sales agents. And, a seven-fold ad budget rise is contemplated. Here is how Rose and Pollack picture B-A's new look:

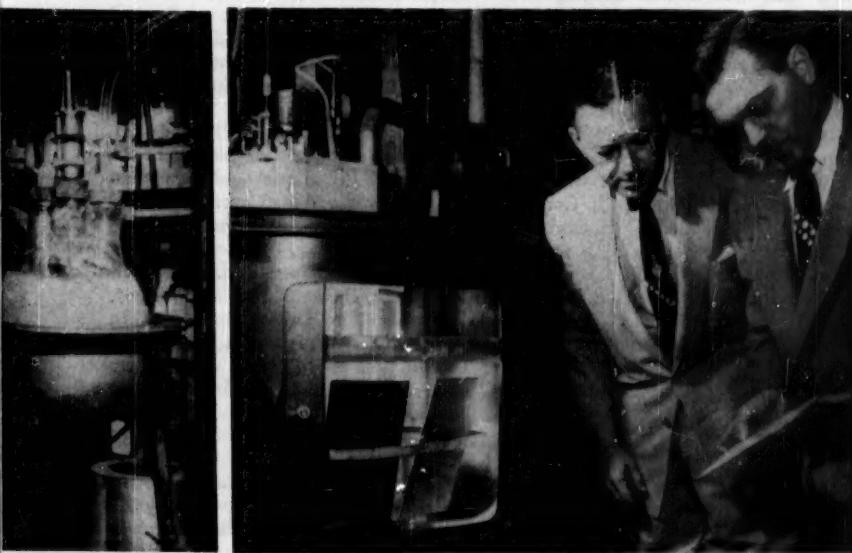
New Products: When a company switches sales accent from crudes to specialties, it needs some new products to sell. Very shortly B-A will offer a synthetic-based high-gloss moisture-set varnish for printing inks. Rose predicts B-A can sell every drop of this new item it can make.

- Later B-A expects to have a new one-coat exterior house paint vehicle (vegetable oil-based) with "less solids and greater hiding power." Rose claims that the "cost is right" and it will enable paintmakers to stretch products without sacrificing quality.

- In addition to paint and ink vehicles, the company is readying a new catalyst for foundry core compounds. Its merits, Pollack maintains, are "decreased baking time with increased strength."

Glancing ahead, B-A eyes a line of prepared protective coating vehicles based on the newer synthetics. Lab work has begun with polyvinyl acetate, butadiene polymers, vinyltoluene, epoxies and epoxies, and polyamides. Sales Manager Rose feels many small-to-medium paint producers would absorb substantial quantities of these products.

Product Diversification: Here the firm is moving into the plastics field



developments (paint test, center), diversified line (plasticizer formulation, right) and . . .

with plasticizers and resins. Currently two plasticizers, dioctyl and diisooctyl phthalate are being kettled. Eventually, plans call for a full phthalate line and adipic sebacate. Too, a general purpose polyester for molding and binding is slated for production several months hence. The polyester sales target: 1 million lbs./year.

Additionally, B-A has hopes of broadening the market for one of its standard products, polywood oil (high-temperature treated tung oil.) At the present polywood oil is used as a plasticizer for chlorinated rubber products. Large rubber companies, however, are interested in extending use to other rubbers. Experimentation to date appears rewarding. With only a few suppliers and a lot of know-how needed for manufacture, Follack declares "the market potential scares me."

Customer Service: Two veteran sales representatives, who both have solid backgrounds in the vehicle field, have been taken on. Later, more will be hired. The lab staff is making more calls and Rose himself goes out frequently. (In the past five months, he's been to Boston, Philadelphia and Baltimore three times, Chicago twice, and Cleveland, Detroit and Minneapolis once.) Much stronger emphasis, too, is now being given to quality control and order-handling. Another boost for service: the extended distributor network.

Distributor Network: For its products and new specialties Rose has been busy revamping B-A's sales outlets.

In order to achieve maximum return from its agents, B-A will work more closely with them, will extend sales direction, technical aid, briefing on promotion plans, a thorough inquiry follow-up system, and full "home office cooperation."

Advertising: Although plans haven't been finalized, Rose has upped his ad budget drastically. Tentative estimates call for a hefty per cent of sales, a six- to sevenfold rise from present figures. Major media: direct mail and business magazine advertising.

Although sales reconstruction has been under way only a relatively short time, Rose and Pollack assert it's already proving effective. First returns:

- In the red for the past few years, B-A has a fair chance of finishing in the black this year, is certain of it for 1955. "Last month," Rose confided, "was one of the best Novembers we ever had."

- The distributor chain is working out. Chicago, the sales boss points out, is doing "extremely well."

- Improvement in customer service and relations is being noticed where it counts—by the customers. The concern is now receiving compliments on its quality and service.

If there is one thing that the experiences of Brown-Allen indicates, it's this: in stiffly competitive times, small companies can profit only by all-out attention to sales building.

Sales Moves: Du Pont is forming a new organization to handle polyisocyanate sales. William Ayscue, assistant rubber chemicals sales manager will head the



BEEFED UP SERVICE: (Left to right) Chemist Hunter and salesman Martenson answer queries of Standard Toch's PA Fendrick and technical adviser Fischer.

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DISTRIBUTION . . .

new unit, with Charles Harrington as his assistant.

• Brea Chemicals, Inc. (Los Angeles) has named Amm-o-gro Div., Specialty Oil Products (San Francisco), distributor of anhydrous ammonia.

• Mona Industries, Inc.'s (Paterson, N.J.) new branch office and warehouse at Greenville, S.C., will serve Virginia, North and South Carolina, Georgia, Alabama and Tennessee.

• Monimoto Chemical has established an intermountain sales branch at Salt Lake City. Headed by E. E. Hammond, the district will cover Utah, Idaho and parts of Oregon, Wyoming and Nevada.

• Enthone, Inc., has assigned additional territory to its Chicago manufacturing distributor, Ardco, Inc. Through its resident sales engineer, James Hendrickson, at St. Louis, Ardco will now service southern Illinois and eastern Michigan.

• Bakelite Co., Division of Union Carbide and Carbon Corp., has appointed Chicago Bridge and Iron Co. a distributor of Microballons, micro-

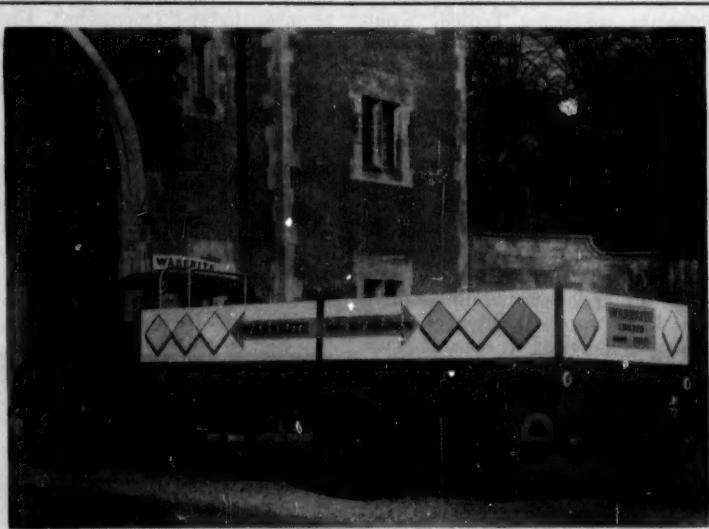
scopic phenolic resin spheres. According to Vice-President and General Sales Manager Fred Goldsby, CB&I will concentrate its present marketing activities on petroleum industry applications.

• Acheson Dispersed Pigments Co. (Philadelphia) has designated B. E. Dougherty Co. (Los Angeles and San Francisco) as a West Coast distributor of its dispersions, vinyl printing inks and base blacks.

• H. L. Blachford, Ltd. (Montreal) has established a U.S. distributor, H. L. Blachford, Inc. (Newark, N.J.) to handle sales of Revertex, a natural-rubber latex produced in the Orient by Revertex Ltd. (London, England).

Chemical Co-op: Pacific Supply Co-operative, which claims to be the largest of its kind in the Pacific Northwest, has contracted for virtually all production of the \$12-million chemical plant to be built by Columbia River Chemical Corp. at Attalia, Wash.

Slated to go onstream in late 1955, CRCC's daily output calls for 160



Plastic Pitch on Wheels

WANT TO SELL more plastic for table tops or other consumer applications? You might find one English firm's stunt a good one to try.

Wareite Ltd. (Ware, Hertfordshire) has spruced up two trucks with side and tailboards made from its laminated plastic veneers bonded to aluminum. Superimposed against a gray stardust pattern on the boards are reproductions of

sprightly colored plastic tabletops, figures, and slogans. A plastic veneer protects the art work from ravaging elements.

Driven daily to London and the South of England, the trucks are proving an effective advertising medium; so much so, in fact, that the drivers now carry leaflets to give to people who stop the truck to ask for information.

tons anhydrous ammonia, 110 tons urea and 140 tons ammonium sulfate. Except for 50 tons anhydrous ammonia and 15 tons urea, which will be sold to industrial accounts, the entire production will be taken by Pacific Supply.

Demonstration Project: Farmers, ranchers and others with agricultural interests in the Midwest will soon be able to make first-hand observations of the use of farm chemicals. Phillips Petroleum Co. has just established its Agricultural Demonstration Project to study:

- Feasibility of using nitrogen and phosphate fertilizer materials on grasses and legumes.
- Rangeland conservation and management.
- Other projects involving measurement of results obtained from application of chemicals and petroleum products to grassland farming.

Located four miles north of Foraker, Osage County, Okla., the demonstration center will cooperate with local, state, federal and related agencies.

Canadian Testing: Canadian Standards Assn. has recently opened new testing laboratories at a site just north of Toronto. A private concern, which tests all foreign and Canadian appliances as well as chemicals, solvents and other liquids used by the Canadian consumer, CSA's premises, now staffed by 190, covers 500,000 sq. ft. The company tests on a voluntary basis for Canadian industry and cooperates in establishing testing methods. A CSA team of engineers, chemists and physicists constantly tour manufacturing plants in Canada and the U.S.

Cement Storage: Improved storage and distribution facilities representing a capital outlay of \$5.5 million are in the works for the Ideal Cement Co.'s Alabama, Louisiana, and Texas plants. Rising cement consumption (perhaps 30% in the next five years) was a factor in the decision.

New Offerings:

- Drum printers for marking steel drums or barrels are now available from the Industrial Marking Equipment Co. (Brooklyn, N.Y.). Some 15 55-gal. drums per minute can be stamped by the machine, which will print lettering, trademarks or illustrations in one color.

- Tight-head 1-gal. drums are now in production by the Vulcan Stamping and Mfg. Co. (Bellwood, Ill.). Meeting ICC-17E specifications, the drums

have a chemical-resistant "high-bake" surface lining. Other linings are available.

- Cyclohexanol in tank-car and carlot drum quantities is now being offered by Monsanto Chemical's Organic Chemicals Division. A technical data sheet on the product is also available on request.

For Your Reference: Ketosol solvent 75, a mixture of acetophenone and phenyl methyl carbinol, is the subject of a new four-page technical bulletin (F-7370). Contents include properties, handling methods and application potentials. Issued by Carbide and Carbon Chemicals Co., New York City.

- Amino acid brochure lists "the 23 most frequently used amino acids for laboratory work." Available sizes and prices are included. Merck & Co., Inc., Rahway, N.J.

- Hypochlorous acid is discussed in detail in the treatise "Hypochlorous Acid: Its Preparation, Derivatives and Properties" by Alfred Globus. For copy, address letterhead request to Guardian Chemical Corp., Long Island City, N.Y.

- Plastic Pipe Standard—The Commercial Standard for Dimensions and Tolerances for Flexible Standard Wall Polyethylene Pipe, CS197-54, has now been issued by the Commodity Standards Division, U.S. Dept. of Commerce. The standard established dimensions, tolerances, sampling methods and test procedures, recommends methods of labeling standard pipe. Obtain from Supt. of Documents, Government Printing Office, Washington 25. Price: 5¢

- Chemical flow charts—a booklet containing product flow charts of the organic and inorganic chemicals industries has been published by Stanford Research Institute, (Stanford, Calif.). Of interest to executives as well as chemists, the charts trace raw materials through intermediates to end chemicals and end uses. Organic chemicals chart lists all products of, or approaching, annual volume of more than 25 million lbs. or \$5 million. Inorganics chart includes products of more than 50 million lbs. or \$5 million. Originally distributed as part of the "Chemical Economics Handbook," the booklet is available at \$5/copy.

- Chemical Products and Processes—Compendium of 1350 federally owned inventions available on a royalty-free license basis. Office of Technical Services, U.S. Dept. of Commerce, (Room 6227), Washington 25, D.C., \$3.

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RESEARCH



GE'S HORN: For silicon, a 'lifetime' boost.

Supplying the Edge

The men who develop new electronics chemicals display a penchant for purity that sometimes seems fanatical. Behind their zeal, however, is the sure knowledge that an extra ounce of purity can be the difference between resounding commercial success and dismal failure. Last week, General Electric researchers revealed with undisguised satisfaction that they had produced a silicon of near-perfect purity, removing the last serious obstacle to the element's use in transistors. Zone melting, a relatively new procedure developed by Bell Telephone Laboratories (CW, March 13, p. 82), made the GE achievement possible.

By means of this refining technique—which utilizes the discovery that a moving molten zone of the element will sweep impurities in its path—GE workers have managed to greatly increase silicon crystals' "lifetime." An electrical measure of purity (chemical methods aren't nearly sensitive enough), "lifetime" is the time required for an artificially induced excess of electrons to drain off a crystal.

The usual "lifetime" of a silicon crystal is at best a few ten-thousandths of a second. "Lifetime" of the new crystals is more than a thousandth of a second.

What this means in terms of concentration is difficult to say. Lacking ordinary methods of analysis, physicists are understandably reluctant to

venture an estimate. But it probably is not unreasonable to peg impurities in parts per billion.

But purity, by any measure, is the key to silicon's electronic future. A semiconductor, like germanium, silicon retains its electrical characteristics up to 400 F, is a logical candidate for high-temperature transistors and power rectifiers. There's one important hitch: to function effectively in these jobs, the element must be free of certain contaminants that capture electrons.

Room for Improvement: Thus far, only experimental silicon transistors made* from a highly pure Du Pont silicon (contaminants are spoken of in parts per 100 million) have been available—and they reportedly leave something to be desired in the way of performance. The extra purity permitted by zone melting will, it is believed, provide the margin of success.

Paradoxically, the zone-melted crystals are deliberately contaminated with minute amounts of selected materials before use in transistors. Known as doping, this procedure allows researchers to accurately obtain the exact level of desired resistivity. This high degree of control—the reason for seeking ultrapurity—is expected ultimately to make possible silicon transistors and rectifiers of uniformly high quality. The product of GE's refining

* By Texas Instrument Co.

method is 10 times purer than needed for practical purposes.

GE and also Westinghouse have a lively interest in the commercial possibilities of a silicon rectifier that promises to offer both compactness and high capacity. Silicon transistors in other roles (e.g., amplifiers) have not escaped the attention of Sylvania, RCA, Bell Laboratories and others. Thus far, however, practical silicon transistor applications have not been notably successful.

Developed primarily for germanium purification, zone melting required considerable coaxing before it would take up with silicon. GE's Hubbard Horn and associates, developers of the final workable technique, were several times on the verge of surrendering the work to seemingly insurmountable problems.

In simplest terms their method consists of successive recrystallizations of silicon as an ingot of the element is slowly drawn through a gas-filled quartz tube. Induction coils, wrapped around the outside of the tube, cause the slowly moving ingot to melt in narrow zones. Impurities concentrated in the molten zones are carried to the ingot's end, leaving behind a near-immaculate silicon.

The new technique is significant also as a clear sign of the surge in silicon research resulting from the recent cut (CW, Nov. 13, p. 85) in the element's cost. Du Pont, which is pioneering silicon process development, has set a price of \$380/lb., \$50 lower than it was, previously. By ordinary standards, that's not cheap, but neither is it prohibitive; enough silicon for a transistor would come to only a few pennies.

GE's Horn, for one, is optimistic about the element's future. "Silicon," he maintains, "is today in the position germanium occupied in 1948. We don't expect it to replace germanium, but rather to supplement it." If his estimate turns out to be correct it will be due—in part, at least—to his own efforts.

On the Block

Twenty six new patents, released for license this week by the government, offer a chance to cash in on commercially promising results of federal chemical research. Included in the liberated group:

- A process developed by Atomic Energy Commission of preparing high-density elemental boron by reacting sodium with boron trifluoride. Other

THIS IS MERCHANTS



This is P. E. Truesdale, Sales Manager of our New York office. While attending college in May, 1943, he joined the Army Air Corps., and served as a pilot with the 387th Bomb group of the 9th Air Force, flying Martin B-26's, in 36 missions over Germany. After working in a chemical plant for one and a half years, he came with Merchants in 1947, and in 1951 was appointed New York District Sales Manager.

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boron halides and other alkali metals also give the desired reaction. The patent (2,685,501) is administered by AEC's patents branch chief.

• Resins of polyalkylene polysulfides that contain ether linkages. Synthesized by a Navy Dept. chemist, the polymers are formed by adding sodium hydroxide and magnesium chloride to a mixture of sulfur, water and sodium sulfide. After the subsequent introduction of 2,3-dibromopropyl ether, the entire mixture is digested for 7-8 hours at 70-75°C. The products are insoluble in water, soluble in some organic. They're covered by patent 2,685,574, administered by Navy's patent counsel.

• Vinyl monomers (either styrene, methyl acrylate or vinyl acetate) stabilized with dianilinogossypol. Described in patent 2,685,597 (administered by Agriculture Dept.'s office of the solicitor), the inhibited monomers resist polymerization by heat and light, may be polymerized by vacuum distilling the inhibitor.

• A method of producing an alkali metal double fluoride of zirconium or hafnium, detailed in patent 2,687,340 (Atomic Energy Commission). Devised by Eugene Wainer, research director of Horizons Incorporated (Cleveland), the procedure comprises heating a solution of a zirconium compound in the presence of fluoride and alkali metal ions. The alkali metal fluozirconate is crystallized from the aqueous phase of the resulting mixture. Electrolytic decomposition of the fluozirconate (in a fused alkali metal chloride bath) yields zirconium metal.

Licenses will be granted on all the above, ordinarily on a nonexclusive royalty-free basis.

Jet Bid for Silicones

Don't read the silicones out of the running for a piece of the jet aircraft lubricant business. Fatty acid diesters (e.g., sebacates) are still the only synthetic lubes approved (CW, Nov. 27, p. 74) by the Air Force, but this week General Electric launched a silicone capable of operating at 400 F.

GE opines that the product is "the first silicone lubricant for jet aviation," but that, of course, must be affirmed by actual use of the material in aircraft. And it appears as if civilian aircraft will have to suffice; the new lube must perform at 450 F before the Air Force will consider it.

Tagged 81406 lubricating fluid, the product is still in development, has already been five years in research. Aside from its aviation use, the silicone has indicated outlets in the glass, steel, ceramics and petroleum industries.

Kurashiki fashions a fiber from acetylene and acetic acid in seven steps:

- 1 Vapor-phase reaction over zinc acetate yields vinyl acetate, which is . . .
- 2 Continuously polymerized in bulk and methanol solution.
- 3 Resulting polyvinyl acetate in methanol is continuously hydrolyzed to polyvinyl alcohol (PVA).
- 4 PVA, in the form of a white powder, is dissolved in water to give a . . .
- 5 Spinning solution that is forced through spinneret apertures into the . . .
- 6 Coagulating bath of Glauber salt.
- 7 Filaments formed this way are rendered water-insoluble by treatment in a formaldehyde-sulfuric acid-Glauber salt solution.

Alarm from the East

It's a wise man who doesn't underestimate his competition. Synthetic fiber researchers may have had that in the back of their minds this week as they uneasily eyed the progress of a commercially new Japanese synthetic that entered the laboratory with two strikes against it.

The scrappy newcomer is a polyvinyl alcohol (PVA) fiber, generically termed vinylon—and Japan is the only nation turning it out.

Kurashiki Rayon Co., the fiber's producer, has just rounded off four years of pioneering production, is now completing a plant expansion that will spring capacity from 8 to 20 tons/day. Output, growing steadily since production got under way, is expected (by the company) to reach a thumping 65 million lbs./year by 1957.

That's not a bad record for a fiber that many good researchers believed wasn't worth developing. Kurashiki's vinylon represents a chemical victory over a near-disabling handicap of the polymer: water solubility. PVA readily dissolves in hot water, a feature that ordinarily doesn't evoke approval from textile men.

On the other hand, water solubility has a lot to offer the fiber maker: spinning from aqueous solution is both simple and economical.

The goal of vinylon research, since the fiber was first patented (U.S. 2,072,302) in 1931 by its German inventors, was to develop an effective technique of insolubilizing after spinning. British, German, Japanese and American chemists all, at one time or another, put their talents to this job.

The Difference: Kurashiki's method, by no means the only one, hinges on acetalization with formaldehyde. Result is a fiber that is essentially water-resistant but not hydrophobic. Vinylon will pick up about 30% of its own weight in water, which is where it sharply differs from nylon, acrylic and polyester synthetics.

But that's not necessarily bad. Because of its hydrophilic nature, vinylon is a potential replacement for cotton in bedsheets, underwear and other textile articles that come into contact with the body. Hitch: damp ironing is still a problem; researchers have succeeded in boosting wet-heat resistance to about 120°C, but more work is needed.

Cotton is the cynosure of the unique fiber's aspirations. Kurashiki's managing director, Tsuzura Tomonari, maintains that cotton and wool production cannot keep pace with climbing world textile demand. It's Tomonari's conviction that there's a golden opportunity for a synthetic that can capture a piece of the burgeoning market for natural fibers. To be successful, obviously, the ambitious candidate must be able to compete in both cost and properties.

On the first count, vinylon promises to come within striking distance of cotton. Produced from low-cost, freely available chemicals by a straightforward process (see box), the fiber has been coming down the slope of what is still an abbreviated cost curve. Introduced at 84¢/lb., it is now at 70¢/lb. and should go to 50¢/lb. in the near future.

If cost can be depressed to 35¢/lb.,

LION OIL COMPANY



J. B. ROGERSON,
MANAGER OF MANUFACTURING

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October 29, 1954

LUMMUS

NOV. 1, 1954
C.A.B.

Mr. C. A. Barrere
Vice President
The Lummus Company
2707 Weslayan
Houston 6, Texas

Dear Mr. Barrere:

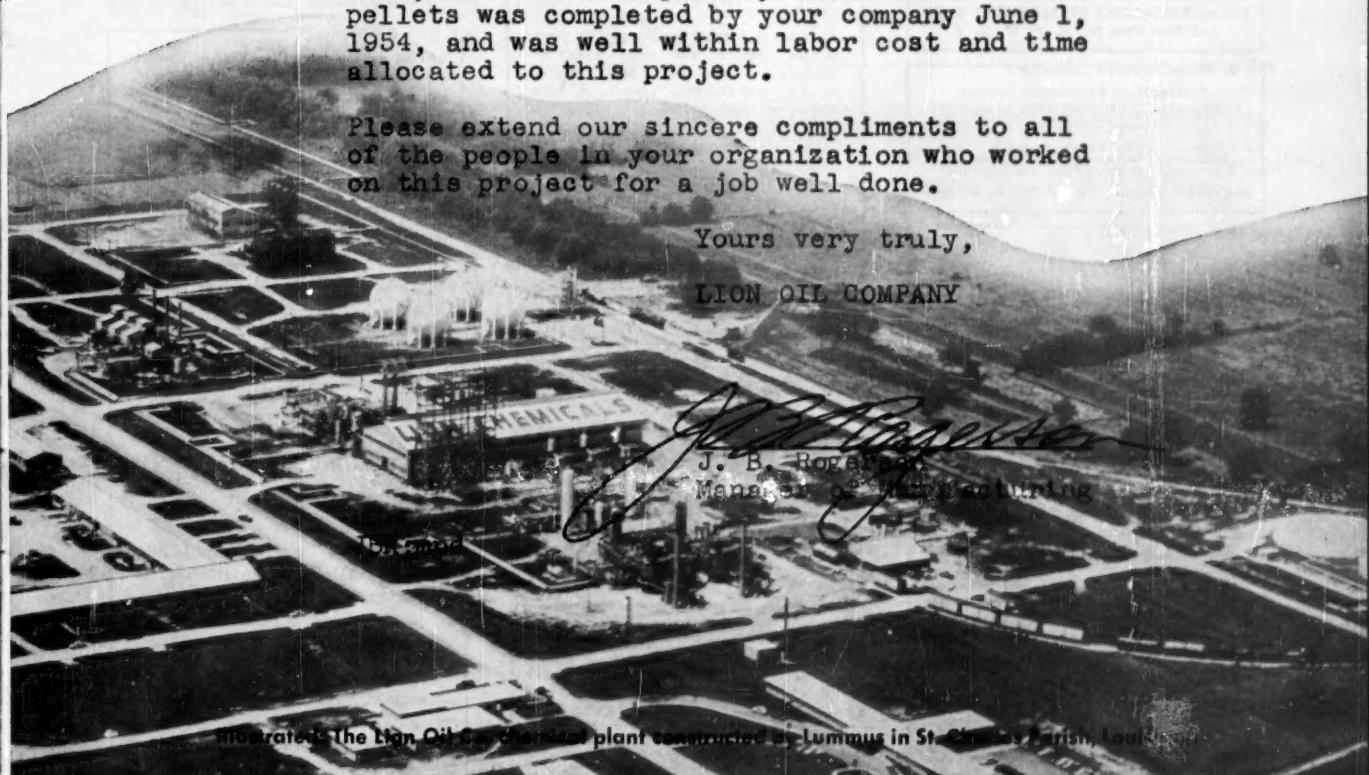
The construction of our chemical plant in St. Charles Parish, Louisiana, to produce 300 tons per day of ammonia, 450 tons per day of nitric acid, and 550 tons per day of ammonium nitrate pellets was completed by your company June 1, 1954, and was well within labor cost and time allocated to this project.

Please extend our sincere compliments to all of the people in your organization who worked on this project for a job well done.

Yours very truly,

LION OIL COMPANY


J. B. Rogerson
Manager of Manufacturing


Illustrated: The Lion Oil Company plant constructed by Lummus in St. Charles Parish, Louisiana.

This recently completed plant has recently been awarded the contract to engineer and construct a 10,000-ton/day ammonia plant for Westvaco Chemical Division of Food Machinery and Chemical Corporation.

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Chemical Engineer: 5 to 10 years' experience. Must be capable of undertaking the development of new processes incorporating the various unit operations. Previous experience in phosphate fertilizers desirable but not necessary if applicant commands practical knowledge of unit operation. Southwestern United States. Send complete resume and salary requirements. P-4934, Chemical Week.

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RESEARCH

Tomonari believes vinylon will annex a substantial slice of cotton's market. That target is no pipe dream; there's a long way to go, but Kurashiki's envisioned expansion of capacity is ambitious enough to make it possible.

Japan may be the world's only vinylon producer, but it is by no means the only country to show a serious interest in the fiber. The Germans went into small-scale production of a PVA fiber back in the 1930s, abandoned the project when demand wouldn't shape up. Thanks partly the success of the Japanese, German interest in vinylon appears to be stirring again.

Here, too, there is new interest in the fiber potential of PVA, although no one is willing to admit a strong proprietary feeling. American synthetics researchers believe it leaves something to be desired on several counts (resiliency is one); with synthetic fiber development costs as high as they are, a new contender would have to be pretty close to an honest-to-goodness "miracle" fiber to get the go ahead.

Sensitive Salts: New light-sensitive salts are the discovery of German researcher Jan Stanek, whose work has culminated in the issuance of German patent 807,891. He found that diazotized *p*-aminodimethylaniline, alone or as a double salt with zinc chloride (or stannic chloride) may be coupled with phloroglucinol to produce dark tones after ammonia-gas development.

Growth Aid: Choline pantothenate—prepared by the reaction of 4-hydroxy-3,3-dimethyl- γ -butyrolactone with choline- β -alanate—was recently found to exert a growth promoting effect in livestock rations. A patent (U.S. 2,653,968) on the discovery has been awarded to Dawes Products Co.

Hypertension Hopefuls: A new group of blood-pressure reducing compounds has been uncovered in the laboratories of G. D. Searle & Co. (Chicago). The drug hopefuls are derivatives of a series of diarylalkanes of which 2,3-bis(*p*-hydroxyphenyl)valeronitrile and the corresponding propionitrile were found to possess high activity.

New Route: Pennsylvania Salt Manufacturing Co. is the assignee of a recent patent (2,673,837) detailing a new electrolytic route to the fluoborates. By means of the Pennsalt technique, molybdenum fluoborate is produced by electrolysis of an aqueous solution of fluoboric acid and boric acid. The cell construction features a large flat horizontal anode of molybdenum beneath

a small water-cooled horizontal tubular cathode.

Do It Yourself: Mellon Institute (Pittsburgh, Pa.) mathematicians are now constructing an electronic computer. Earmarked exclusively for research, the embryonic mechanical "brain" was conceived by Mellon's John Bowman, as a means of speeding his calculations-clogged investigations of chemical distillation theory.

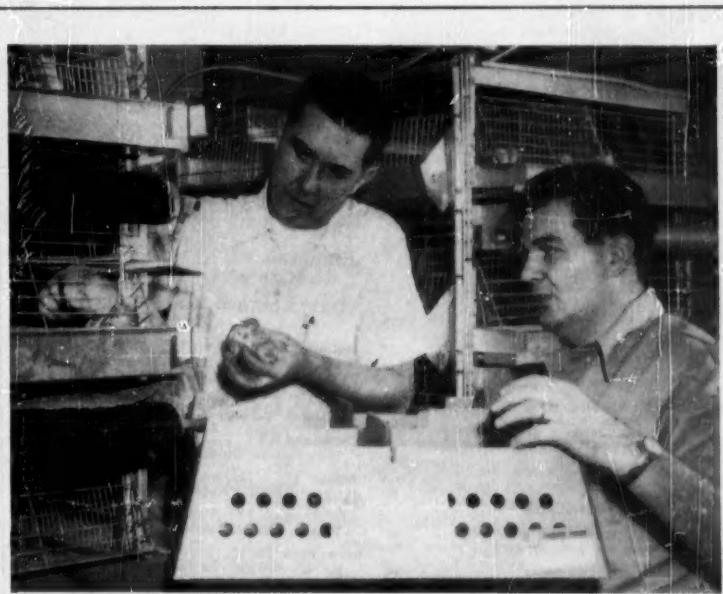
Mission Accomplished: A classic chemical problem, the synthesis of natural rubber, has at last been solved by researchers of Goodrich-Gulf Chemical Co. The synthetic product cannot compete costwise with its natural forerunner or GR-S, but it is the subject of a patent application. Details of the synthesis are under wraps. Properties of the product are said to mirror those of crude natural rubber.

New Booster: An unidentified nutritional factor is entering the livestock feed supplement scramble. Termed Vigo factor by Chas. Pfizer (Brooklyn, N.Y.), it is said to be superior to anti-

biotics and vitamin B₁₂ in promoting swine and poultry growth. The factor was discovered by staffers of the Pfizer Agricultural Research division (Terre Haute, Ind.) described at last week's American Society of Animal Production meeting.

• Also from Terre Haute came the results last week, of a comparison of two methods of chemical growth stimulation. H. Luther, director of Pfizer's agricultural research farm, produced test data that gave natural sex hormones the edge over diethylstilbestrol in stimulating the growth of beef cattle. According to Luther's calculations sex hormone-implanted steers gained weight 20% faster than those fed stilbestrol. Progesterone and estradiol were used in the tests. Pellets containing these hormones are produced by Syntex Animal Products (a Pfizer subsidiary), which has filed an application with Food & Drug Administration for sale of the product as a cattle beifer.

Shift: Pittsburgh Plate Glass Co.'s paint and plastics research has vacated its Milwaukee, Wis., quarters for brand-new laboratories at Springdale,



Custom Built Chicken House

THE UNEASY CHICKS shown above are part of a contingent of 1500 feathered occupants of Monsanto's new animal nutrition laboratories (St. Louis, Mo.). Christened last week, the completely air-con-

ditioned laboratories will shelter research striving for new drugs and agricultural chemicals. Animal husbandman Philip Elmer (left) and biochemist Richard Gordon settled the creatures in their new home.

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RESEARCH . . .

Pa. Unveiled last week, the research building is a three-story concrete structure containing approximately 68,000 sq. ft. of floor space. Eighty five chemists, engineers and technicians staff the facilities.

Debut: A new plasticizer has been given the green light by Carbide and Carbon Chemicals Co. (division of Union Carbide and Carbon Corp.). Designated Flexol 426, it's a distilled mixed alcohol phthalate that appears to be aimed squarely at the vinyls. Carbide says it has high solvent power for vinyl chloride resins, is stable to heat and light, imparts good low-temperature properties to vinyl plastics. Potential outlets: vinyl flooring, extrusions, insulation. The newcomer is also said to be compatible with nitrocellulose, acrylate and chlorinated rubber polymers.



Versatile Hybrid

THIS UNFAMILIAR instrument, half spoon and half spatula, is Fisher Scientific Co.'s new bid for the laboratory apparatus trade. To be introduced next month, the "spoonula" (as it is called by the company) permits the lab chemist to scoop powder or crystals from the bottom of a bottle, with one end, deliver them to the pan of a precision balance, with the other. It's also fine, reports Fisher, for getting at that last olive or for spreading anchovy paste on snacks.

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Schutz-O'Neill test lab uses a standard production model 16" Superfine Pulverizer. Mill components on wall at left in photo provide up to 100 different pulverizing set-ups.

The two condensed actual cases which follow are typical of the many pulverizing problems met by Schutz-O'Neill equipment.



NO. 1 - PULVERIZING CERAMIC MOLDING MATERIALS

THE PROBLEM: To develop ceramic materials for precision molding of high temperature, high fidelity alloy castings for jet aircraft engines. Castings of molybdenum, columbium, and other rare metals were to be made. By producing precise castings, less machining is required and more rare metal saved. The particle size for best results (determined by university consultants) fell within the 60 to 200 mesh range.

THE TESTS: The Schutz-O'Neill test lab processed 200 pounds of the feed material, in a series of tests with the university ceramic consultants and the contracting firm present.

THE SOLUTION: Schutz-O'Neill designed a system that is now producing 1,000 to 1,200 pounds per hour of ceramic material 85 to 90 percent within the required 60 to 200 mesh range.

NO. 2 - PIGMENTS UNDER 25 MICRONS FOR COLORING PLASTICS

THE PROBLEM: A leading chemical firm producing a variety of resins and plastics wanted to reduce and intimately blend pigments for coloring molded plastic forms. The manufacturer found that particles larger than 25 microns produced streaks in the finished molding. In addition, tints prepared from more than one color necessitated absolute dispersion and optimum blending to insure proper shading and depth.

THE TESTS: Laboratory test runs were carried on at Schutz-O'Neill. The resulting product was analyzed in the manufacturer's lab. In their report to Schutz-O'Neill, the firm stated, "In all our tests your grinder was equal to or better than the others from the standpoint of fineness of grind and absence of pigment specks in our product".

THE SOLUTION: The chemical firm is being supplied with a 22" Schutz-O'Neill stainless steel Superfine Pulverizer.

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